National Institute on Drug Abuse

RESEARCH

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Drug Abuse Prevention Through Family Interventions

177

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Drug Abuse Prevention Through Family Interventions

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Editors:

Rebecca S. Ashery, D.S.W.

Elizabeth B. Robertson, Ph.D.

Karol L. Kumpfer, Ph.D.

NIDA Research Monograph 177
1998

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health

National Institute on Drug Abuse
Division of Epidemiology and Prevention Research
5600 Fishers Lane
Rockville, MD 20857

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no.177
1998

ACKNOWLEDGMENT

This monograph is based on the papers from a technical review on "Drug Abuse Prevention Through Family Interventions" held on January 25-26, 1996. The review meeting was sponsored by the National Institute on Drug Abuse.

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National Institute on Drug Abuse
NIH Publication No. 99-4135
Printed December 1998

NIDA Research Monographs are indexed in the *Index Medicus*. They are selectively included in the coverage of *American Statistics Index, BioSciences Information Service, Chemical Abstracts, Current Contents, Psychological Abstracts,* and *Psychopharmacology Abstracts.*

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Drug Abuse Prevention Through Family-Based Interventions: Future Research

Kathleen E. Etz, Elizabeth B. Robertson, and Rebecca S. Ashery

The goal of prevention science is to prevent, delay the onset of, or moderate problems such as substance abuse, associated disorders, and psychopathologies. In the area of drug abuse, prevention research has focused on the study of risk and protective factors that may identify at-risk individuals or groups. In general, these factors are assumed to either increase or decrease the probability that problems will occur (Coie et al. 1993). The relationship between risk and protective factors and problem behaviors is complicated in that the salience of a risk factor may change depending on the cultural and physical context, the presence of other risk and protective factors, and the developmental status of the group or individual. Consequently, prevention researchers often rely on a systems perspective to aid in understanding the influences of multiple contexts on human behavior. This perspective helps elucidate how the individual both influences and is influenced by these contexts and the people and events in them over the course of development.

The major context for drug abuse prevention programs has been the school (Dusenbury et al. 1997; Gorman 1997). School-based interventions generally focus on increasing academic achievement and on skills training, including social, decisionmaking, communication, and refusal skills. Despite the prevalence of school-based interventions, research has also demonstrated that other contexts within the social ecology are appropriate and important points of contact for interventions. These include the family, recreational and religious settings, the community, and the workplace. This monograph focuses on family-based interventions.

Interventions designed for the family target risk and protective factors specific to the family context as well as interactions between the family and other contexts that may involve the child or have an impact on the child. Research has identified a number of family-level risk and protective factors associated with initiation of drug use (Kumpfer, Olds, Alexander, Zucker, and Gary, this volume). Specifically, studies show that the presence of substance abuse disorders among parents or other

family members poses both genetic and social risks for children (Bry 1994; Dumka et al. 1995; Johnson and Montgomery 1989; Merikangas, Dierker, and Fenton, this volume; Van Hasselt et al. 1993). Other family risk factors include parental or sibling use of alcohol, tobacco, and other drugs; positive family attitudes toward and acceptance of substance use; lack of attachment to parents at any developmental stage; sexual or physical abuse; economic instability; and poor family management (Hawkins et al. 1992, 1985). Protective factors in the family include consistent and contingent discipline; a strong parent-child bond; high levels of supervision and monitoring; and parental warmth, affection, and emotional support (Ge et al. 1996; Hawkins et al. 1992). Dishion and colleagues (1988) have demonstrated the importance of the family as an intervention context by showing, in longitudinal and cross-sectional analyses of prevention interventions, that enhancing parenting behaviors that have been shown to be protective can have a positive influence on the child. Specifically, they demonstrated that skill in parental monitoring can be taught and that this skill is a viable method of preventing early-onset drug use in children.

Additionally, research indicates that protective family factors can moderate the effects of risk factors. Specifically, Brook and colleagues (1990) found that the risk of associating with peers who use drugs was offset by protective family factors such as parent conventionality, maternal adjustment, and strong parent-child attachment. Their research stresses the importance of the ongoing role of the family in the socialization of children well into the adolescent years.

Family prevention interventions have successfully used behavioral, affective, and cognitive approaches to target a variety of family behaviors. Among them are parent-child interaction strategies, communication skills, child management practices, and family management skills (Bry, Catalano, Kumpfer, Lochman, and Szapocznik, this volume). A major factor that distinguishes family-based prevention interventions with positive outcomes from other parenting programs is that, similar to successful school-based programming, they concentrate on skill development rather than on simply educating parents about appropriate parenting practices. Effective programs use interactive teaching strategies to present skills to parents and their children, allow for practices and feedback, assign homework, and then help family members refine skills that work and modify those that do not.

Another factor that contributes to the success of family interventions is who participates. Family interventions may focus on the parents or child separately or on the family as a whole. Among the most innovative and effective are those interventions that include parents and children in individual and group training sessions. In these interventions, work is done individually with the parents and the children and then the entire family is brought together to practice the skills and strategies learned in the individual sessions. This approach may be complicated if parents divorce and remarry. For example, Collins and Shanahan (this volume) found it necessary to collect data from three families (the original nuclear and two stepfamilies) to gain a full picture of the whole family for one child.

Although the number of research-based family prevention interventions is increasing, there are still relatively few that have been subjected to rigorous efficacy studies and even fewer that have subsequently been replicated with diverse populations under less controlled conditions. However, this is rapidly changing, and many advances are being made. Currently there are universal, selective, and indicated family-based programs in the field (Catalano, Kosterman, Haggerty, Hawkins, and Spoth, this volume; Institute of Medicine 1994; Kumpfer, this volume). Some programs that originally targeted one population have been modified for others. For example, the Strengthening Families Program was originally designed as an indicated intervention for parents on methadone maintenance (Kumpfer, this volume). It has now been adapted for universal audiences (Spoth, this volume) and for use in a variety of cultural and physical contexts.

In addition, the field is broadening the research scope beyond simply testing the efficacy and effectiveness of interventions to include other features important to the development and dissemination of successful family prevention interventions. For example, some researchers have begun to examine implementation methodology issues related to dosage, recruitment and retention (Spoth et al. 1996), and fit between interventionist and family members. Others are working to more carefully tailor interventions to meet the needs of specific family problems (Dishion, Kavanagh, and Kiesner, this volume) or to be culturally (Martin et al. 1996) or developmentally appropriate (Prinz 1994). Finally the emerging field of prevention services research is tackling issues such as describing what is currently available at the community level, how decisions are made about the provision of

services, determining the cost-effectiveness of services, and how prevention services are financed, organized, and managed.

FOCUS ON FAMILY INTERVENTION

In recognition of the primary role of the family in preventing drug abuse and the desire of the National Institute on Drug Abuse (NIDA) to increase scientific understanding of that role, the Prevention Research Branch in the Division of Epidemiology and Prevention Research launched a program of work in the area of family prevention intervention research. A broad definition of family was adopted: Family of origin; family of procreation; blood-, adoptive-, or marriage-related kin; or nonrelated persons who consider themselves to be part of the family through mutual commitment, whether living in one or different households. Three meetings were held to explore the issues.

The first meeting had dual objectives: (1) to review the state of scientific knowledge regarding the efficacy and effectiveness of family-based drug abuse prevention interventions and (2) to identify gaps in knowledge and suggest theory-based hypotheses and methodologies appropriate for advancing the field in those gap areas. Meeting participants included national experts involved in family-based drug abuse prevention research and related prevention areas. The meeting began with an overview of the contributions of family etiology and prevention research and continued with presentations of exemplary universal, selective, and indicated family-based prevention intervention models. Panelists discussed and elaborated on the information presented, explored what has been learned from other fields (Kumpfer, Alexander, McDonald, and Olds, this volume) and then discussed challenges for future research.

The topics for the second and third meetings emerged from this meeting. The second meeting focused on parental monitoring. Specifically, the task was to further clarify and operationalize the definition of this concept. This was deemed critical because research to date indicates that parental monitoring is an essential parenting role that plays an important part in reducing the risk of substance use initiation and escalation in youth (Dishion and McMahon, this volume). The third meeting focused on the identification of valid and reliable measures for use in prevention research (Collins and Shanahan, this volume; Dishion, Li, Spracklen, Brown, and Haas, this volume; Liddle and Rowe, this volume; McMahon and Metzler, this volume). An outcome of this meeting was

the recommendation that, to the extent possible, family-based prevention researchers use a common set of measures to allow for comparisons across data sets. The chapters in this volume evolved from the proceedings of these three meetings.

RECOMMENDATIONS FOR FUTURE RESEARCH

Although this was not a goal, recommendations for future research directions emerged from the three meetings (Spoth, this volume). These were noted and are listed here. Time constraints prevented the discussion and formulation of a full research agenda, but the following items provide a starting point for such an activity. Points are divided into six subsections: etiology, prevention intervention content, research methodology, prevention methodology, dissemination, and prevention services research. Some areas such as prevention services research and dissemination were less adequately discussed than others, while policy research was not addressed (Biglan and Metzler, this volume; Chatterji, Werthamer, Lillie-Blanton, and Caffray, this volume).

Etiology

- More research is needed to identify social, emotional, cognitive, and familial antecedents of substance abuse as they change during different developmental stages of individual family members and the family.

- Etiologic research should examine the multiple and overlapping pathways to drug abuse. This would include examining the interaction of factors such as developmental status, ethnic group membership, and geographic location.

- Studies are needed to examine how the environment, including the family environment, interacts with and influences individual vulnerability to substance abuse.

- Individual and family-linked psychopathologies should be examined as a major pathway to the development of drug abuse.

Prevention Intervention Content

- Parental monitoring should be a continuing emphasis of programming across the development of the child and the family.

- Research-based effective programs and program strategies from other fields should be adapted and replicated for use in preventing substance abuse.

- Replications of efficacious programs are needed to determine their potential generalizability to subpopulations not included in the original efficacy studies.

- Special attention should be paid to gender, particularly the differential impact of program content by gender.

Research Methodology

- Families are embedded in a social context. Measures and analyses should consider the impact of the broader context (neighborhood, school, and work) on the family and the effectiveness of prevention programming. To accomplish this, new measures and analysis strategies may need to be developed.

- Longitudinal studies of family interventions should use methods such as time series analysis to maximize understanding of family processes, dynamics, and changes over short and long periods of time.

- Interrelationships among variables such as parental monitoring, association with deviant peers, and academic achievement should be considered when designing a measurement plan for family-based prevention intervention research projects.

- Meta-analyses should be conducted to provide the statistical power necessary to identify various common components and pathways of successful family-based drug abuse prevention programs.

- Culturally sensitive measures should be employed in determining risk and protective factors specific to subpopulations with whom family prevention intervention are being used.

Prevention Methodology

- Adequate dosage is critical to the effectiveness of prevention programming. Family prevention intervention research should monitor and document dosage levels and use those data in assessing efficacy.

- Booster sessions following interventions have been shown to be effective in sustaining positive outcomes. More research is needed to better understand the type, number, developmental timing, interval between and duration of boosters that account for the continued positive effects.

- Family recruitment, especially the recruitment of hard-to-reach populations, and the factors influencing retention in interventions need to be subjected to detailed examination. In addition, the issue of recruitment bias needs to be tracked and accounted for in analyses of program outcome.

- Strategies and program components that appear to be particularly effective need to be examined in detail. Special attention should be given to determining for what level of intervention (universal, selective, indicated) they are most appropriate and effective.

- Strategies and components of family prevention intervention programs should be examined to determine both the impact of specific components and which ones account for program effectiveness. Special attention should be paid to program strategies, components, and content that may be harmful to families and family members.

Dissemination

- Programs that have been shown to be efficacious and effective should be made available to the public. The best strategies for accomplishing this need to be systematically studied.

Prevention Services Research

- Research is needed that examines the processes through which organizations adopt research-based family intervention practices.

SUMMARY

As the primary socialization unit of the child, the family is an important context for the prevention of many problem behaviors, disorders, and diseases, including substance abuse. Over the course of their development, children become less dependent on the family and more dependent on peers for social and emotional support and for cues regarding appropriate or expected behaviors. However, research indicates that parents play a powerful role in determining their child's peer group and that the influence of parents on children's values, attitudes, and beliefs is enduring. Children and adolescents tend to choose peers who come from families with values similar to those of their family. Moreover, the areas in which peers are more influential tend to be those related to fashion, slang, and activities, whereas parents tend to have a greater influence on decisions that can have long-term effects.

The enduring influence of parents in the child's life points to the need for family-based drug abuse prevention programs that span the childhood and adolescent years. Obviously, identifying and working through family-based programs with children who exhibit early problem behaviors can be extremely beneficial in preventing later problems. However, there currently are few such programs that have been subjected to rigorous empirical testing. On the other hand, a number of excellent family-based programs have been demonstrated to be efficacious in preventing initiation or escalation of drug use in the early and later adolescent years.

One challenge that faces family based-prevention programs is determining how to make contact with and engage families. A number of new approaches are being tested, including programs that make contact with families at a universal level through the school and then channel those families in need of more services into selective and indicated programming (Dishion, Kavanagh, and Kiesner, this volume). Other approaches include engaging parents through programs or contexts in which they are already participating, for example, working with methadone maintenance program participants through their treatment center or contacting parents through their workplace.

Family-based prevention interventions have shown a great deal of promise for preventing drug use. Through research, scientifically based approaches with known efficacy can be developed. This monograph

represents a first step, indicating the state of family-based prevention research and pointing to directions for future research. It is hoped that this monograph will stimulate researchers to conduct further research in family prevention interventions, including addressing the gaps identified and incorporating many of the suggestions made during the meetings.

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AUTHORS

Kathleen E. Etz, Ph.D.
Social Science Analyst

Elizabeth B. Robertson, Ph.D.
Chief

Prevention Research Branch
Division of Epidemiology and Prevention Research
National Institute on Drug Abuse
Parklawn Building, Room 9A-53
5600 Fishers Lane
Rockville, MD 20857

Rebecca S. Ashery, D.S.W.*
Deputy Director
Secretary's Initiative for Youth Substance Abuse Prevention
Center for Substance Abuse Prevention
Substance Abuse and Mental Health Services Administration
U.S. Department of Health and Human Services
Rockwall II, Room 940
5515 Security Lane
Rockville, MD 20852

* Formerly of the Prevention Research Branch, NIDA

Familial Factors and Substance Abuse: Implications for Prevention

Kathleen R. Merikangas, Lisa Dierker, and Brenda Fenton

Several decades of research have revealed that the etiology of drug abuse comprises a complex network of interactive social, biologic, and genetic factors, which exhibits different levels of salience across development. There are several excellent summaries of the extensive literature on risk factors for drug use (Brook et al. 1990; Clayton 1992; Dembo et al. 1985; Hawkins et al. 1992; Kumpfer 1989; Swaim 1991), but far less is known about the risk and protective factors for drug abuse or dependence. Risk factors for drug abuse generally fall into three major domains: the individual, the family, and the social environment, which includes peer, school, neighborhood, and the broader cultural background. This chapter focuses on the role of familial factors in the etiology of substance abuse.

CURRENT KNOWLEDGE ON THE ROLE OF FAMILIAL FACTORS IN THE ETIOLOGY OF DRUG ABUSE

Family Studies

The familial aggregation of alcoholism and drug abuse has been well established. (For comprehensive reviews of alcoholism see Merikangas 1990 and McGue 1994; for drug abuse see Croughan 1985; Gordon 1994; and Rounsaville et al. 1991). Controlled family studies of alcoholic probands reveal a threefold increased risk of alcoholism and a twofold increased risk of drug abuse among the relatives of probands with alcoholism compared with those of controls. Numerous family history studies and systematic family studies of substance abusers in treatment settings (Croughan 1985; Gfroerer et al. 1988; Hill et al. 1977; Meller et al. 1988; Mirin et al. 1988, 1991; Rounsaville et al. 1991) reveal a significantly increased risk of both alcoholism and drug abuse among relatives when compared with population expectations. However, these findings are suggestive at best because of insufficient evidence from family studies, which employ contemporary family study methodology to investigate the familial patterns of drug abuse. The optimal

methodology includes an epidemiological sample of pure and comorbid probands recruited from both treatment and community settings, direct interviewing of available first-degree relatives, and a contemporaneous control group selected with similar methods.

To date, there are only two family studies of drug abusers in which relatives were interviewed directly (Mirin et al. 1991; Rounsaville et al. 1991) and only one family study with a non-drug-abusing control group (Rounsaville et al. 1991). Though the latter study was by far the most rigorous to date, the integration of controls from a separate family study limited the comparability of the groups of relatives because of differences in methodology.

In order to more accurately assess the risk of drug abuse in relatives, it is important to examine different generations or cohorts to take into account the availability of illicit substances across time periods. Family studies that investigated generational differences in the transmission of substance abuse revealed that drug use (Gfroerer 1987) and abuse (Merikangas et al. 1992) is elevated among siblings of drug abusers and that there is a direct relationship between parental drug use (Gfroerer 1987) and abuse (Luthar et al. 1992; Merikangas et al. 1992) and use and abuse in offspring. Furthermore, Merikangas and colleagues (1992) showed that there is a strong association between rates of drug abuse in siblings of opioid abusers and the number of parents with substance abuse.

High-Risk Studies

In recent years there has been a burgeoning empirical interest in children presumed to be at high risk for future psychopathology. Unfortunately, the high-risk study paradigm has been applied nearly exclusively to the major psychiatric disorders and to alcoholism. There is sparse information on the development of drug use disorders among young offspring of parents with drug abuse.

PATHWAY TO SUBSTANCE DISORDERS

The investigation of the risk of drug disorders in younger offspring of substance abusers is inherently limited by the fact that they have not yet passed through the period of risk for the onset of these disorders. However, psychopathology may be an intermediate outcome on the pathway to substance use disorders, which may be feasibly examined in

this young group. For example, substance abuse has been found to be associated with the major psychiatric disorders—particularly anxiety and affective disorders—both in clinical samples and in the general population (Anthony and Helzer 1991; Bukstein et al. 1989; Deykin et al. 1987). It is believed that persons with major psychiatric disorders may actually have an increased vulnerability to substance abuse, because the substance may ameliorate the symptoms of the underlying psychiatric condition (e.g., self-medication hypothesis).

A cross-sectional study of high school students found that children above the 85th percentile in anxiety were four times more likely to have used alcohol than those below this percentile (Walter et al. 1991). Moreover, Knop and colleagues (1993) recently demonstrated a specific association between anxiety in childhood and the subsequent development of alcoholism in a 30-year prospective longitudinal study of a large birth cohort in Copenhagen, Denmark. The evidence also suggests that deviant behaviors, conduct problems, and antisocial personality are strongly associated with both alcohol and illicit drug use/abuse (Kandel 1980; Robins and McEvoy 1990). A prospective study of a cohort of 8- to 12-year-olds by Boyle and colleagues (1993) showed that teacher-rated conduct disorder predicted the use of alcohol and hard drugs 4 years later. Although attention deficit hyperactivity disorder have been considered to be etiologically related to substance abuse, more recent evidence has suggested that the majority of hyperactive children who later abused drugs had conduct and/or oppositional defiant disorder either before or coincident with the onset of substance abuse.

The results of a community study by Rubio-Stipec and associates (1991), which linked parental and child disorders, showed an increased risk of internalizing rather than externalizing problems among the offspring of alcoholic parents. Likewise, Reich and colleagues (1993) found increased rates of overanxious disorder among offspring of alcoholic parents. One of the few high-risk studies of drug abuse has been described in a series of papers that report the results of a study of preadolescent sons of fathers with and without substance abuse who participated in a longitudinal study at the Center for Education and Drug Abuse Research (CEDAR) at the University of Pittsburgh (Moss et al. 1994). Although examination of the magnitude of substance abuse is precluded by the youthful age of this sample, several reports have presented information on behavior problems and temperamental factors associated with paternal substance abuse. An elevation in problem behaviors, namely externalizing conduct problems and socialization problems (Moss et al. 1994), increased rates

of anxiety disorders (Moss et al. 1995) and higher levels of aggressivity, inattention, and impulsivity (Martin et al. 1994) than sons of non-substance-abusing fathers. Similarly, Gabel and Shindledecker (1992) reported that sons of substance-abusing parents had more conduct diagnoses in association with severe aggressive/destructive behavior than sons of non-substance-abusing parents, while daughters of substance-abusing parents were more likely to receive attention deficit hyperactivity disorder and conduct diagnoses than the girls of non-substance-abusing parents. Wilens and colleagues (1995) likewise reported significantly elevated scores on dimensional symptom rating scales among the children of opioid-dependent parents.

SUBSTANCE DISORDERS

There are several studies that have investigated the link between parental and adolescent drug use (Duncan et al. 1995). Numerous studies of college students have examined the association between parent and offspring substance problems (Annis 1974; Fawzy et al. 1983; Meller et al. 1988; Scherer 1973; Scherer and Mukherjee 1971; Smart and Fejer 1972). Nearly all studies reported an association between alcohol and illicit drug use in parents and their college-age offspring. However, all of the latter studies employed self-report questionnaires regarding drug use in both parents and the students, thereby limiting the conclusiveness of the findings. In addition, a sample that has entered college may not be representative of all persons with a family history of drug use/abuse. Findings from a family history study of alcoholism revealed that the emergence of differences in risk of alcohol and other drug use among individuals with a parental history of alcoholism and controls may occur at the time of transition from late adolescence to early adulthood, which may be a critical period for the expression of substance use vulnerability (Pandina and Johnson 1989). Thus, studies that investigate early patterns of substance use and abuse among individuals at high and low risk for substance abuse may fail to discriminate between those with true vulnerability for substance use problems.

There are few studies of high-risk substance abusers with long periods of prospective observation of cohorts at high and low risk for the development of substance abuse. Individuals examined in the critical period from late adolescence to early adulthood must be followed prospectively to differentiate extended substance abuse from the heavy experimentation often seen in this period. One of the few studies involved a longitudinal

Danish birth cohort at high and low risk for alcoholism based on a paternal history of alcoholism, which revealed that there was little difference in the drinking behavior of young men at age 20 (Schulsinger et al. 1986); however, at the followup at age 30, substance dependence, but not abuse, was significantly more frequent among the male offspring of alcoholic fathers than among the male offspring of nonalcoholic fathers (Knop et al. 1993). These findings support the need for adequate followup intervals of high-risk youth to ensure that the majority of the cohort have passed through the age of risk for substance disorders and to clearly define the increase in substance-related problems that occur at different stages of development. In studies of high-risk cohorts, oftentimes little attention was paid to the mating type of the parents, as alcoholic fathers have been the primary exposure variable.

Among studies of high-risk young offspring of parents with alcoholism, findings have generally supported an increase in risk for the development of alcohol use, other drug use, and related problems (West and Prinz 1987). For example, Chassin and colleagues (1991) found parental alcoholism to be a significant risk factor for child symptomatology and substance use among 10- to 15-year-old offspring, with the risk found to be stronger among those offspring of parents with current rather than remitted alcoholism. Similarly, Johnson and associates (1989), Reich and colleagues (1993), and Hill and Hruska (1992) reported an increased risk of substance-related problems among the offspring of alcoholic parents. In a sample of college freshmen, Sher and associates (1991) found that children of alcoholics reported more psychiatric stress as well as more alcohol and other drug problems and received more diagnoses of alcohol disorders than the comparison group of subjects without a family history of alcohol and other drug disorders.

However, to date, there are no controlled studies of offspring of substance abusers other than alcoholics from which estimates of the risk of the development of drug abuse can be derived. As described below, the first wave of data from the Yale Family Study of Comorbidity of Substance Abuse and Anxiety Disorders provides the initial data on the risk of substance abuse and psychopathology among offspring of parents with alcohol or other drug abuse.

SPECIFIC FAMILY FACTORS

Genetic Factors: Twin Studies

There are an increasing number of twin studies that have provided evidence that genetic factors play a major role in the familial aggregation of substance use and abuse. Although most twin studies of substance abuse have focused on alcoholism, there are two published studies that have investigated twin concordance for other drug abuse or dependence in a large series of twins (Jang et al. 1995; Pickens et al. 1991). Pickens and colleagues (1991) found that both male and female monozygotic twin pairs had a 1½-fold increased risk of drug abuse compared with dizygotic pairs, but the heritability of drug abuse was significant only for males, possibly due to the low number of female pairs with substance abuse. Sex differences in the components of the genetic and environmental factors also emerged; the concordance for males could be attributed to both shared genes and environmental factors, whereas for females, the majority of variance was attributable to the unique environmental experiences of individual twins.

There are also several twin studies of use of specific drugs, including nicotine, caffeine, tranquilizers, and sedatives (Claridge et al. 1978; Gurling et al. 1985; Jang et al. 1995; Pedersen 1981), and components thereof. The highest twin correlations were reported for nicotine (0.84) and caffeine (0.78) in Pedersen's (1981) study of the Swedish twin registry. Jang and associates (1995) reported a moderate degree of heritability for the frequency of use and the tendency to use of numerous illicit substances ($h^2 = 0.32$).

The results of a large-scale twin study of male Vietnam era veterans have recently become available (Tsuang et al. 1993). The major results suggest that (1) substance abuse is highly heritable, (2) the contribution of genetic factors is more significant for frequent use or abuse than for nonproblematic use, and (3) the influence of genetic factors, shared environment, and the unique environment each contributes to the development of substance abuse. Additional analyses of data from this twin registry reveal that some of the subjective effects of marijuana, including suspiciousness and agitation, are under genetic control (Tsuang et al., in press).

One of the strongest sources of evidence regarding the role of genetic factors in the etiology of drug abuse derives from monozygotic twins

reared apart. Grove and colleagues (1990) examined the concordance for alcoholism, drug abuse, and antisocial personality disorder among monozygotic twin pairs separated at birth. The heritability estimate of drug abuse of 0.45 far exceeded that of alcoholism of 0.11. Furthermore, drug abuse was strongly associated with conduct disorder in childhood and antisocial personality in adulthood. These findings suggest that genetic factors explain a large proportion of the variance in the development of drug abuse and that a large proportion of the heritability of substance abuse in adulthood can be attributed to shared genetic factors that underlie the development of behavior problems in childhood (Grove et al. 1990).

EVIDENCE FOR SPECIFIC VULNERABILITY GENES: BIOCHEMICAL/GENETIC MARKERS

Studies of associations between genetic markers or their biologic products have yielded no consistent biologic markers for drug abuse. The lack of findings is not unexpected in light of the heterogeneity of substance abuse, differential patterns of comorbidity with disorders that are also under some degree of genetic control, and the very nature of drug abuse resulting from gene-environment interaction at the level of exposure as well as subsequent use and abuse.

Of particular importance are the specific neurochemical mechanisms through which the genetic factors described above exert their influence. Aside from the investigation of alcohol metabolism, there has been little research on metabolism as well as the affective and cognitive effects of specific drugs in high-risk samples for obvious ethical reasons. However, etiologic models of the development of drug abuse need to include the role of the specific effects of various drugs in either enhancing or reducing subsequent exposure to drugs. More information could be accumulated indirectly in observational studies by systematically inquiring about specific effects of drugs and drug(s) of preference.

SPECIFIC GENETIC AND ENVIRONMENTAL FACTORS: ADOPTION STUDIES

The optimal study paradigm for discriminating the role of genetic and environmental factors and their interaction in the development of a disorder is the cross-fostering study in which either (1) adoptees with biologic vulnerability are reared in homes of non-drug-abusing adoptive

parents or (2) adoptees who lack a parental history of substance abuse are reared in homes of parents with substance abuse. Such studies can determine the effects of biologic vulnerability and environmental exposure to substance abuse and their mutual influence in the risk of substance abuse. The classic adoption studies of Cadoret and colleagues (1986, 1992, 1996) have been highly informative in elucidating the role of genetic factors in the development of drug use and abuse in a U.S. sample. The major results of their studies reveal that genetic factors play a far more important role in the transition from drug use to abuse than in drug use itself. Additionally, their work identifies two major biologic/genetic pathways to the development of drug abuse in adoptees: One that is driven by substance abuse in the biologic parent and is limited to drug abuse and dependence in the adoptee and another that appears to be an expression of underlying aggressivity and is related to criminality in the biologic parent (Cadoret et al. 1995). These pathways to drug abuse were recently confirmed in a study of female adoptees by the same group of investigators (Cadoret et al. 1996). Exposure to a sibling or peer with deviant behavior appears to contribute to the development of drug use but not abuse. None of the adoption studies have thus far been able to detect a gene-environment interaction in the genesis of drug initiation or in the transition from use to abuse (Cadoret 1992).

Summary

In summary, the results of family, twin, and adoption studies of substance abuse reveal that both drug use and abuse are familial and that genetic factors explain a substantial proportion of the variance in the etiology of drug abuse. Factors associated with increased familial aggregation of drug abuse include male gender, parental concordance for drug abuse, and comorbid psychopathology, particularly alcoholism and antisocial behavior. Drug dependence is far more heritable than either drug use or abuse, and genetic factors appear to be more important in the transmission of drug problems among males. The results regarding the role of genetic factors in the persistence, but not initiation, of certain substances confirm findings in animals (Marley et al. 1991). These findings are particularly interesting when all three sources of genetic evidence also suggest two independent pathways to drug abuse; one in which shared etiologic factors influence the development of antisocial personality and drug use and another that appears to underlie the development of drug dependence. However, there is a striking lack of controlled family studies of substance abuse. These studies are critical for elucidating the role of genetic and environmental factors in the transmission of substance abuse, validating

phenotypic definitions of substance use/abuse, and identifying sources of heterogeneity in the etiology of substance abuse, particularly with respect to the role of comorbid psychiatric disorders and polysubstance abuse.

MECHANISMS FOR FAMILIAL TRANSMISSION

Family Factors Specific to Drug Abuse

There are several specific and nonspecific environmental mechanisms through which parents may convey increased risk of substance abuse to their offspring. The mechanisms through which families may enhance the risk of drug use and abuse in their offspring include the following:

- Specific factors
  - Exposure to drugs
  - Modeling of drug use
  - Parental concordance for drug abuse

- Nonspecific factors
  - Disrupted family structure
  - Marital discord
  - Impaired parenting
  - Exposure to stress
  - Family psychopathology
  - Neglect
  - Abuse

Aside from transmission of genetic factors that determine the physiological effects of drugs and metabolism, the family may also enhance the risk of drug abuse through several factors specific to drug use as well as a broad range of nonspecific factors that characterize homes of parents with dysfunction secondary to a psychiatric or somatic illness. Parents may directly influence the use and abuse of drugs in their offspring through (1) exposure to drugs in the prenatal phase of development, (2) providing negative role models in terms of general use/abuse of drugs or the use of drugs as a coping mechanism, or (3) enhancing the availability of drugs.

Several investigators have examined the role of exposure to parental drug use and the risk of drug use among offspring of parents with substance abuse (Duncan et al. 1995). The use of other drugs or alcohol as a coping strategy among parents may serve as a model for the

development of maladaptive coping skills among offspring (Patterson 1986). Several studies have found that in addition to exposure to parental drug use, parental attitudes toward drug use may also play a key role in the attitudes and behavior related to drug use among offspring (Barnes and Welte 1986; Brook et al. 1986). The effects of either direct modeling of parental substance use or the tendency to use substances as a coping mechanism have been shown to have far smaller effects on drug use in offspring than other parent influences, chiefly those involving the quality of the parent-child relationship and parental monitoring of the behavior of their adolescent offspring (Molina et al. 1994).

Nonspecific Family Factors

As listed in table 1, nonspecific factors through which parental drug abuse and its sequelae may influence offspring include disrupted family structure, exposure to marital discord, impairment in parenting behavior, exposure to high levels of both acute and chronic stress, social deprivation, and physical, sexual, and emotional abuse. The high divorce rates among substance abusers may also be associated with an elevated risk of the development of substance abuse in offspring and deviant behavior in general due to the nonintact home and disrupted family structure. Such families have been found to have less stability and more moves and thus require coping and adaptation strategies that may far exceed the ability of exposed youngsters (Peterson and Zill 1986; Zimmermann-Tansella et al. 1988). Clair and Genest (1987) reported that the families of alcoholic children were far more dysfunctional than those of controls. Furthermore, Smart and Chibucos (1990) found that adolescents who came from extreme families were especially vulnerable to substance use. Social stress emanating from the disruptive family environment of substance-abusing parents has also been shown to increase drug use among exposed adolescents (Rhodes and Jason 1990).

The parental marital relationship does not appear to have a direct impact on drug use, although it does appear to interact with other risk factors in enhancing the risk of drug use (Kaplan 1995). However, some investigators have noted that family conflict is associated with the youngster's delinquency and drug use (Robins 1980). Indeed, parental conflict may be a greater risk factor than disrupted family structure resulting in parental absence (Farrington et al. 1988). Adolescents with substance-abusing parents experience more stress (Brown 1989) and more negative life events than those from non-substance-abusing families (Roosa et al. 1990).

Parental substance abuse may also contribute to family dysfunction, which is then related to such negative outcomes as the initiation or escalation of substance abuse (Gabel and Schindledecker 1991; McCarthy and Anglin 1990). Dysfunction in the relationships between parents and adolescents is also associated with an elevated risk of adolescent substance abuse. Substance-abusing parents have been shown to provide less social or emotional support to their children (Holden et al. 1988). Evidence from several studies reveals that strong parent-child bonding may inhibit drug use and delinquent behavior in adolescents (Hawkins et al. 1992), whereas poor relationships are associated with an increased risk of drug use in offspring (Brook et al. 1980, 1986). Whereas poor communication and lack of parental support may directly lead to adolescent substance use, Brook and colleagues (1990, 1993) showed that drug use by an adolescent offspring may serve to further disturb parent-child interaction (Brook et al. 1990, 1993; Kaplan 1995; Kumpfer and Hopkins 1993).

The effect of maternal drug use on parenting and the subsequent use of drugs in offspring was described by Kandel (1990), who found a strong relationship between maternal drug and control problems with their children. Subsequent studies have shown that poor parental control is associated with drug use. Molina and associates (1994) found that both parental monitoring and socialization were associated with substance use, irrespective of whether the parent was alcoholic. In contrast, increased levels of parental monitoring or control (Baumrind and Moselle 1985; Duncan et al. 1995) were associated with a decreased risk of substance use in offspring. Likewise, Brook and colleagues (1986, 1988) found that both parental control and attachment served to inhibit drug use among adolescents. Appropriate parental monitoring was also effective in reducing delinquency (Patterson et al. 1982). These studies all provide support for the current notion that the family is the single most influential childhood factor in buffering the child and in shaping later adaptation (Kumpfer 1987).

The relationship between parental substance abuse and childhood behavioral problems indicative of abuse or maltreatment was studied by Gabel and Shindledecker (1990) in a sample of children hospitalized for suicidal ideation/behavior or aggressive/destructive behavior. The results revealed that parental substance abuse and suspected maltreatment were the major indicators of confirmed cases of child abuse. Even more commonly associated with parental substance abuse is neglect, which

can have major physical and emotional consequences for exposed children.

ILLUSTRATIVE EXAMPLES FROM THE YALE FAMILY STUDY OF SUBSTANCE ABUSE

The next section describes the results of a large-scale family study of substance abuse, which provides preliminary evidence to support the role of familial factors in the development of substance abuse. The major goals of the study were to investigate the magnitude and patterns of transmission of substance abuse in families and the role of parental other drug and alcohol abuse on the development of emotional and behavioral problems and substance use and abuse among offspring.

Sample Characteristics

A total of 299 probands were selected from outpatient specialty clinics for substance abuse (drug abuse/dependence and/or alcohol abuse/dependence) disorders at the Connecticut Mental Health Center (New Haven, Connecticut) or through a random digit dialing procedure in the greater New Haven area. The probands were assigned to one of five lifetime diagnostic groupings based on an algorithm designed to reflect predominant levels of psychopathology. The groupings were as follows: 27 probands with cocaine abuse/dependence, 87 probands with opioid abuse/dependence, 35 probands with a *Diagnostic and Statistic Manual of Mental Disorders (Third Edition, Revised) (DSM-III-R)* diagnosis (American Psychiatric Association 1987) of drug abuse of the anxiolytic class (e.g., marijuana, sedatives, benzodiazepines), 89 probands with a *DSM-III-R* diagnosis of alcohol abuse/dependence, and 61 normal controls with no history of a *DSM-III-R* Axis I disorder. Assignment to a substance cell was based on an algorithm that incorporated the subjective report of the substance of choice and predominant substance of abuse/dependence based on quantity, frequency, and chronicity. All probands were directly interviewed according to the procedures described below. Probands were excluded from the study if there was evidence of significant organic mental impairment or if they were found to have schizoaffective disorder or schizophrenia.

Interview Procedures

Once consent for participation in the study was obtained from the probands, they were directly interviewed, and a pedigree was generated that identified spouses, ex-spouses with whom probands had children, and all first-degree biological relatives. The proband provided family history data on all first-degree relatives. The interviewer was kept blind to the diagnostic grouping of the proband. Permission to contact first-degree relatives as well as their addresses and phone numbers was obtained at the initial interview. An independent interviewer, blind to the diagnosis of the proband, was then assigned to contact the spouse or first-degree relatives of the proband. Children of the proband younger than age 18 were enrolled in a high-risk study using parallel as well as additional measures. Relatives were directly interviewed either by telephone or in person.

The total sample included 280 probands who had 1,267 first-degree adult relatives. Approximately equal proportions of relatives were interviewed when compared across proband groupings.

Assessments

The diagnostic interview for adults was the semi-structured Schedule for Affective Disorders and Schizophrenia (SADS), current and lifetime versions (Endicott and Spitzer 1978), extensively modified to obtain *DSM-III* and *DSM-III-R* criteria (American Psychiatric Association 1987). The major modifications of this instrument included (1) addition of an open-ended section designed to facilitate rapport between the interviewer and subject as well as target key diagnostic sections to be completed, (2) addition of questions on the interrelationships of disorders in terms of temporal sequence and shared symptomatology, (3) elicitation of information on psychiatric disorders and subthreshold manifestations of the key criteria for multiple diagnostic systems, (4) the application of a polydiagnostic approach through the assessment of the criteria for multiple diagnostic systems, and (5) the expansion of the substance abuse sections to obtain more detailed information on the patterns of use of each drug class and their interrelationship and on the course of alcohol and other drug use and abuse.

Family History Information

Family history information was obtained using a modified version of the Family History-Research Diagnostic Criteria (FH-RDC) developed by Andreasen and colleagues (1977) for data collected by the family history method that was modified to obtain both *DSM-III* and *DSM-III-R* diagnoses in adults and children and to obtain more detailed information on alcoholism and anxiety disorders for the purposes of this study. The interviewer first obtained a brief open-ended summary of the interpersonal characteristics and history of emotional or behavioral problems and then inquired about the quality and frequency of contact that the interviewee had with the target relative. Key probes regarding each major diagnostic category of *DSM-III-R* Axis I, as well as antisocial personality disorder, selected childhood disorders, and other behavioral problems were then discussed.

Interviewers

All interviewers had an adequate level of clinical training in clinical psychology, school psychology, or social work and underwent a series of formal training sessions with the training package in family study methods that the authors developed. All of the interviewers were required to demonstrate interrater reliability of ratings with ratings of the tapes and supervised coratings of live subjects. Each interview was reviewed by a psychiatrist or psychologist who provided ongoing supervision of the interview process.

Diagnostic Procedures

The clinical interviewers assigned diagnoses to each interview according to *DSM-III-R* criteria. A psychiatrist blind to the diagnosis of the proband then reviewed each case and provided feedback to the interviewers to resolve diagnostic ambiguities.

Procedures for the "best-estimate" diagnoses on interviewed subjects used by the authors' team were an expansion of Leckman and colleagues' (1982) original protocol. The final diagnoses were based on all available information, including the diagnostic interview, family history reports on each proband and relative, and medical records. All cases were subjected to initial review by clinical psychologists and doctoral students in psychiatric epidemiology. Reliability among reviewers was established by having the group follow general rules and guidelines highlighted in a

procedures manual as well as corate a number of cases independently. Discrepancies between the initial diagnostic review and best-estimate diagnosis were resolved jointly by a team of clinicians.

Sample of High-Risk Children

The present study also involved an epidemiologic sample of high-risk children and adolescents of parent probands with alcoholism and/or substance abuse/dependence of the anxiolytic type or no psychopathology. Families in the high-risk component of the study included a total of 87 families of 52 probands diagnosed with anxiolytic, sedative, or benzodiazepine abuse, marijuana abuse or dependence, or alcoholism (substance group) and 35 proband controls having no history of psychiatric disorder (normal group). A total of 137 biological offspring ages 7 to 18 were eligible for interview in this study, of whom 134 (98 percent) were interviewed directly.

A modified version of the Kiddie-Schedule for Affective Disorders and Schizophrenia (K-SADS-E) was used for diagnostic assessment of the children (Chambers et al. 1985; Orvaschel et al. 1982). The K-SADS-E has been found to be a reliable and valid instrument for obtaining lifetime diagnoses on prepubertal children by its authors (Orvaschel et al. 1982) and on adolescents by others (Chambers et al. 1985; Gammon et al. 1983). Test-retest reliability following a short interval of time ranged from 0.41 to 0.81 (intraclass correlation coefficient) for summary scales. The reliability of diagnoses ranged from 0.24 to 0.70 (kappa statistic).

In the present study, the K-SADS-E was administered by a clinical psychologist blind to the diagnosis of the parent. The interview was administered independently with the child and with the mother about the child by the same interviewer. A best-estimate procedure for diagnoses was applied to the children in the present study (Leckman et al. 1982). This diagnosis is based on all available information, including the diagnostic interview, family history reports on the child, teachers' reports, and medical records. The diagnosis was made by a psychiatrist who was blind to the diagnostic status of the parents and who was not involved in direct interviews. If the subject met criteria for any psychiatric disorder, the records were reviewed independently by a second diagnostician.

Parent-Child Relationship

The Yale Family Study used the Parental Bonding Instrument (PBI) (Parker et al. 1979), which is a self-report measure of two dimensions of parenting—care and protection. These dimensions have been investigated individually and jointly (quadrants) with respect to offspring psychopathology. Twenty-five attitudinal and behavioral items were completed on both parents by each offspring. In addition, the parent who was directly interviewed about the child also completed a PBI describing their parenting behavior toward that specific child. The PBI has high test-retest reliability (Mackinnon et al. 1989; Plantes et al. 1988; Warner and Atkinson 1988).

Family Functioning

The Family Adaptability and Cohesion Evaluation Scale (FACES) was used to assess family functioning. The FACES III is a 111-item self-report instrument that measures family cohesion and adaptability and includes a social desirability scale (Olson et al. 1985). The overall FACES has demonstrated acceptable internal consistency (0.62 to 0.77) and test-retest reliability (0.80 to 0.83) as well as content and construct validity. With respect to the self-report version of the FACES used in this study, it has recently been demonstrated that the scores should be interpreted linearly (Olson 1991). Each interviewed family member (older than age 11) assessed his or her perception of the family's cohesion and adaptability by self-report.

In addition to the FACES-III, interviewed adults (older than age 18) also completed the McMaster Family Assessment Device (FAD) to measure family functioning (Epstein et al. 1983). The FAD is a 60-item self-report measure that contains seven subscales: (1) problemsolving, (2) communication, (3) family roles, (4) affective responsiveness, (5) affective involvement, (6) behavior control, and (7) general functioning (overall measure of family health/pathology). In addition to the use of continuous scores, subscale cutoffs have been established (Miller et al. 1986).

MAJOR FINDINGS

Familial Aggregation of Substance Abuse

Table 1 presents a summary of the results of analyses of familial transmission of alcoholism and other drug disorders in the adult relatives according to the presence of alcohol or other drug disorders in the proband. Each of these models controlled for relevant confounders of the relationship between proband and relative substance abuse, including sex of the proband and the interview status, age, and sex of the relative.

The results of table 1 reveal that after controlling for polysubstance abuse and other covariates in the proband and relative, alcoholism in the proband was associated with significantly elevated risk ratios of alcoholism in the relatives (OR = 4.1). This confirms the well-established familial aggregation of alcoholism in families. Other drug disorders in probands were associated with other drug disorders in relatives, with a risk ratio of 3.7. There was no increase in other drug disorders among relatives of alcoholic probands or vice versa. Indeed, other drug abuse/dependence in the proband was associated with a lower risk of alcoholism in relatives (OR = 0.5). These findings suggest some degree of specificity of transmission of alcoholism and other drug abuse/dependence in families.

Substance Abuse in Offspring

The rates of alcohol and other drug abuse among the adolescent offspring of these probands are presented in table 2. Although the mean age of the sample is only 12, a striking association emerges between parental substance dependence and alcohol and other drug abuse among the offspring. Whereas none of the offspring of parents without substance abuse or psychopathology exhibit substance abuse problems, 20 percent of the offspring of the substance-abusing parents meet criteria for alcohol or other drug abuse. Rates of alcohol abuse are twofold greater than those of other drug abuse, but no major sex differences emerged at this early stage of development. These findings suggest that the offspring of parents with other drug abuse are at increased risk for the development of substance abuse themselves. This is particularly striking when one considers the youthful age of this cohort and the inclusion of probands with either marijuana or anxiolytic abuse rather than "hard" drugs such as cocaine or opioids.

TABLE 1. *Substance abuse in relatives of probands with alcoholism and other drug abuse.*

	Disorders in Relatives	
	Alcohol	Other Drug
Factors in Model	N = 312	N = 157
Proband		
Other drug	0.5 ($p < 0.01$) (0.4 - 0.7)	3.7 ($p < 0.01$) (2.3 - 5.9)
Alcohol	4.1 ($p < 0.01$) (2.8 - 6.0)	1.1 (0.7 - 1.9)
Sex	1.2 (0.9 - 1.7)	1.8 ($p < 0.05$) (1.2 - 2.8)
Relative		
Other drug	5.8 ($p < 0.01$) (3.9 - 8.8)	
Alcohol		6.0 ($p < 0.01$) (3.9 - 9.1)
Sex	0.4 ($p < 0.01$) (0.3 - 0.5)	0.6 ($p < 0.10$) (0.4 - 0.9)
Age	1.0 (0.99 - 1.01)	0.9 ($p < 0.01$) (0.92 - 0.95)
Interview Status	2.4 ($p < 0.01$) (1.7 - 3.4)	1.6+ (0.99 - 2.5)

TABLE 2. *Substance abuse in offspring older than age 12, by parental substance abuse.*

	Parent Proband					
Disorders in Children	Substance			Normal		
Sex of child	M	F	Total	M	F	Total
N of children > 12	N = 19	N = 20	N = 39	N = 14	N = 14	N = 28
Total alcohol/other drug abuse/dependence	21.1	20.0	20.5	0	0	0
Alcohol abuse/dependence	15.8	20.0	18.0	0	0	0
Other drug abuse/dependence	5.3	15.0	10.3	0	0	0

Family Environment of Substance Abusers

Families share their environment as well as their genes, and both biology and environment may increase their common risk for various psychiatric disorders. Physical (family structure and socioeconomic status) as well as social (family functioning including dyadic relationships) characteristics constitute the family environment. Parental psychopathology has been associated with increased rates of marital discord and both divorce and separation. However, the effects of parental psychiatric status appear global and impact negatively on parenting and overall family functioning.

The associations observed between parental psychopathology and parenting/family variables are important because of their potential impact on the mental health of offspring. Low levels of care from parents have been associated with offspring psychopathology. Marital distress as well as unhealthy family functioning styles were also associated with both mood and behavior disorders. Both extremes of the range of family cohesion and adaptability have been associated with offspring psychopathology.

Table 3 presents selected family structure and function domains for high- and low-risk families.

TABLE 3. *Family/home environment of children by proband parent group.*

	Proband Parent		
Family Characteristics	Substance (N = 77)	Normal (N = 54)	*p*
Parents divorced (%)	28.4	2.9	< 0.001
Low socioeconomic status (%)	40.3	20.0	< 0.01
Parent family functioning			
Parental care (mean score)	21.0	26.0	< 0.01
Family cohesion (mean score)	3.4	4.2	< 0.01

Offspring of substance abusers were less likely to be living with both parents and more likely to be in a group of lower socioeconomic status. With respect to the care dimension of parenting style, parents with substance disorders had significantly lower care scores. In addition, families with a substance-abusing parent had lower family cohesion scores. Family functioning was further examined by parental mating type. Those families with two affected parents had higher proportions of unhealthy functioning regardless of the particular combination of parental diagnoses. Although the rate of unhealthy functioning was elevated in the one-substance parent group, it did not significantly differ from the neither- affected mating type. The findings regarding family cohesion are similar, with those families with two affected parents (one of whom has a substance abuse diagnosis) being significantly more disengaged than comparison families.

Lower family cohesion was associated with both internalizing and externalizing diagnoses in the offspring. Female offspring showed an increase in internalizing disorders in families with poorer overall family functioning. Offspring of affected parents are subjected to multiple environmental risks for psychopathology.

IMPLICATIONS FOR PREVENTION AND TREATMENT

The results of this review suggest that a family history of substance abuse is one of the most potent risk factors for the development of substance abuse among exposed offspring. Both specific and nonspecific factors in the family contribute to the increased risk of drug abuse. The results of this study confirm the findings of the family history studies of Hill and colleagues (1977), which reported independent familial transmission of alcoholism and opioid abuse and that of Meller and associates (1988), which demonstrated the specificity of transmission of alcoholism and other drug abuse in relatives of probands with substance abuse. The moderate degree of independence of familial alcoholism and drug abuse suggests that the knowledge gleaned from the large body of research on family and high-risk studies of alcoholism may not apply to families of drug abusers. Moreover, the authors' family study data provide some evidence for specificity of transmission of the individual classes of drug abuse after controlling for the effects of antisocial personality among the probands. This suggests that there may be some vulnerability factors that predispose to the development of dependence on specific classes of drugs rather than to deviant behavior in general.

Likewise, Gfroerer and colleagues (1988) and Duncan and associates (1995) found a direct link between parental and offspring marijuana use that in the former study was not influenced by parental nicotine or alcohol use. Similar results emerged from studies of parent-child concordance for nicotine abuse (Bauman et al. 1990). These findings confirm the results of the longitudinal studies of children who yield two distinct general pathways to the development of drug abuse: one, which represents a manifestation of a generalized pattern of behavioral disturbances, including behavioral disorders in childhood, and another more heterogeneous pathway, which may result from a constellation of individual vulnerability factors for the development of dependence of specific classes of drugs. Emotional and behavioral disorders in childhood are a particularly key domain of vulnerability that require further recognition and evaluation.

This work suggests that future research should seek an understanding of the mechanisms through which the family conveys an increased risk of drug abuse to offspring, since a family history of substance abuse is the most potent predictor of vulnerability to its development. Study designs that incorporate the complexity of factors involved in familial transmission—including genetic factors, transmitted biologic factors, social and cultural factors, and nontransmitted biologic and social factors—are critical to gaining an understanding of these processes. The genetic epidemiologic approach is one of the most powerful in understanding the mechanisms through which families exert their influence on the transmission of drug abuse across generations to incorporate the components of the host vulnerability; factors associated with exposure to drugs; and the contribution of the family, peer neighborhood, and larger cultural environment conducive to its development.

Evidence presented in this chapter strongly supports the critical importance of family-based prevention programs for prevention of substance abuse. The findings suggest that targeted prevention should be geared toward offspring of substance abusers, even those who have not been identified in treatment settings. The majority of the substance abusers in the present study were identified from a random community sample, yet the magnitude of drug abuse in their offspring even at this early stage of adolescent development was quite striking.

These findings also have important implications for both primary and secondary prevention efforts. Primary prevention programs should seek

to evaluate risk factors for the development of substance abuse, including both parental and family factors and individual characteristics of the children, which may be associated with elevation in the risk of drug abuse, particularly psychopathology such as conduct problems and depression/anxiety. Comprehension of the complex interrelationships among individual, familial, and broader social environment is critical to reduce continued substance abuse in both adults and children. This suggests that a combination of individual and family treatment in conjunction with broader efforts toward education and prevention at the community level will provide the optimal approach to reduce substance abuse.

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AUTHORS

Kathleen R. Merikangas, Ph.D.
Associate Professor of Epidemiology and Psychiatry

Lisa Dierker, Ph.D.
Associate Research Scientist

Brenda Fenton, M.Sc.
Research Fellow

Genetic Epidemiology Research Unit
Yale University School of Medicine
40 Temple Street
New Haven, CT 06510

Family Etiology of Youth Problems

Karol L. Kumpfer, David L. Olds, James F. Alexander, Robert A. Zucker, and Lawrence E. Gary

A GLOBAL INCREASE OF ADOLESCENT SUBSTANCE ABUSE

After a decade of apparent declines in substance use in 12th graders, school surveys are indicating an increase in the ever-used rate in 8th graders of 16.7 percent for marijuana, 58.8 percent for alcohol (26 percent having been drunk), 46 percent for cigarettes, and 20 percent for inhalant use (Johnston et al. 1995). Drug abuse among young adolescents (primarily eighth graders) has increased for 4 years (1992 to 1996) since eighth graders were added to the high school seniors sampled for many years in the Monitoring the Future Study (Johnston et al. 1995). The reported increases over 4 years are substantial—a 37-percent increase for marijuana, a 59-percent increase for hallucinogens, and a 115-percent increase for cocaine.

This upswing in drug use is a distinct change from the decreases in drug use reported for about a decade in high school seniors. The prior decrease appears to have been caused by an actual decrease in the popularity of illicit drug use correlated with increased awareness of the negative consequences of drug use, but also may have been related to increasing the high school dropout rates of drug-using students not included in the survey. Now that eighth graders have been added to the Monitoring the Future Study, it is easier to attribute the increases to actual increases in drug use, rather than to artifacts of a changing population each year and high school seniors using fewer drugs.

Concurrent with increasing substance use rates is increasing juvenile crime. Between 1984 and 1993, delinquents arrested for violent crimes increased nearly 68 percent, and the trend is accelerating (Federal Bureau of Investigation 1994). Huizinga and associates (1994) report strong relationships among drug use, delinquency, and gun use.

This increase in substance use and delinquency in adolescents is occurring worldwide—not just in this country. After a year of global

travel, Kumpfer (1996) has speculated that this increased drug use is related to increased numbers of children being raised in poverty, resulting in parents working more hours and spending less time with their children. Parental neglect is related to poor school achievement, association with drug-using peers, and eventually tobacco, alcohol, and other drug use. Lack of legitimate jobs for poorly educated youth leads to increased interest in perceived "golden opportunities" to make money in illegitimate activities, such as drug trafficking. The poor or have-nots worldwide are learning how to make illicit drugs to sell to the children of the more affluent countries. For instance, substance abuse prevention specialists in South America report that drug use among youth is rising. Peasants learn how to turn cocaine into a base paste called basuco, lace cigarettes with basuco, and sell them outside schools. Methamphetamine recipes are available on the Internet. Because drugs can be made in any home or backyard, supply cannot be stopped. As long as desperate poor people need some way to make money to live, the only way to reduce drug addiction is to reduce demand and initiation.

Unfortunately, drug demand is increasing, as is drug addiction among youth. Therapists treating drug-dependent adolescents report that a number of these youth are children of the 1970s hippies. These therapists believe that family factors such as parental role modeling of drug use, positive parental attitudes about drug use, and parental tolerance of their children using drugs are related to the increased use among youth today.

The importance of family risk and protective factors and processes in the development of drug abuse and dependency is becoming increasingly recognized. Most empirically tested, multicausal etiological models of substance use have verified with actual data the critical importance of family factors in guiding developmental trajectories in youth toward or away from drug use and other problem behaviors (Ary et al., in press; Brook et al. 1990; Kumpfer 1996; Kumpfer and Turner 1990/1991; Newcomb 1992; Newcomb and Bentler 1987; Swaim et al. 1990). Years of research in developmental psychology and social learning theory demonstrate that family socialization processes are the primary predictors of children's behavior. The importance of family influence in drug use suggests that more research-based, family-focused interventions, in addition to the popular school and peer-focused interventions, are needed to reduce adolescent drug use.

CONTENTS OF CHAPTER

This chapter discusses etiological research from different fields, because prevention and treatment must be informed by the knowledge of the causes of developmental psychopathology. To be successful, prevention interventions must impact the pattern of multisystemic influences in a way powerful enough to alter the trajectory of problem youth. In this chapter, the following topics are covered:

- The etiology of substance abuse and dependency and individual biopsychosocial risk factors, including the comorbidity of problem behaviors in youth
- Developmental trajectories in problem youth as discussed by developmental stages of prenatal, infancy, childhood, and adolescence
- Ecological models and the interrelations among risk domains and the relationship of maternal lifecourse and caregiver dysfunction to substance abuse and antisocial behavior
- Family risk or protective processes that make children vulnerable to or protected from developmental psychopathologies and substance abuse

INDIVIDUAL RISK FACTORS

Increasing research suggests that conduct disorders and other behavioral and temperament traits that increase a youth's vulnerability to drug use develop as a fairly stable pattern as early as 5 years of age (Zucker et al. 1995). Characteristics of these young children that appear to developmentally vector them in the direction of a comorbid developmental psychopathology of drug abuse and other developmental problems (Alexander and Pugh 1996) include:

- Impulsivity, reduced ego control, and attention deficit disorder (Cicchetti et al. 1993; Farrington et al. 1990; Hinshaw et al. 1993)
- Difficult temperament (Patterson 1986; Rothbart et al., in press)

- Below-average verbal IQ (DeBaryshe et al. 1993; Tremblay et al. 1992) and academic underachievement (Hinshaw et al. 1993)

- Negative affect (Compas 1987) and difficulties with emotional regulation (Cole and Zahn-Waxler 1992)

- Social incompetence (Blechman et al. 1995)

- Aggression and coercion as means to rewards (Patterson et al. 1992; Quay 1993)

Children of substance abusers, who are likewise at risk for substance abuse, have a higher burden of these risks (Kumpfer and DeMarsh 1985). Research suggests that these individual risks can accrue because of genetically inherited vulnerabilities or through environmental physiological (in utero drug exposure, head trauma, poor nutrition) or psychological damage (deficient socialization and care) (Merikangas 1994; Tarter and Mezzich 1992). However, twin studies (Pickens and Svikis 1986) and adoption studies suggest a pure genetic basis for some part of substance abuse vulnerability. Genetically inherited individual risk factors include neurological deficits in prefrontal cognitive functioning and verbal abilities, difficult temperament, hyperactivity, autonomic hypereactivity, depression, anxiety, low threshold for pain, thrill-seeking, and different reactions to alcohol and other drugs making the drugs more pleasurable and easily abused (see Kumpfer 1987 and Tarter and Mezzich 1992 for a review).

Gene-environment interactions, particularly between the child's psychological temperament and the family environment and parenting skills of the caretakers, determine whether an inherited vulnerability will be expressed. One example illustrating the importance of nurturing parenting involves depression spectrum disease (DSD), a type of major depression characterized by families in which male relatives are alcoholic and antisocial, but females are depressive. Although DSD is considered a controversial topic and has not been substantiated in some other research (Merikangas 1990), recent adoption research suggests that in such families, major depression in females was predicted by the alcoholic diathesis only when combined with disturbed adoptive parenting. These same researchers found only a main effect (disturbed adoptive parenting) in predicting increased adoptee drug abuse (Cadoret et al. 1995), but a gene-environment interactive effect in predicting aggression and conduct disorders in adoptees. Additionally, these

researchers found that conduct disorder and aggressivity were important intervening variables in the relationship between antisocial personality disorder and adoptee drug abuse and/or dependency.

THE COMORBIDITY OF PROBLEM BEHAVIORS

The overlap of these drug abuse risk factors with those for delinquency and other problem behaviors are striking. In fact, adolescent substance abuse, delinquency, conduct disorders, and other problems in youth are not independent, isolated problems (Alexander and Pugh 1996). Different types of chronic problem behaviors such as substance abuse, antisocial behavior, high-risk sexual behavior, and academic failure are sufficiently intercorrelated to justify a single problem behavior construct (Ary et al., in press; Donovan et al. 1988; Metzler et al. 1995; Osgood et al. 1988).

These problem behaviors tend to cluster in children raised in dysfunctional families by parents who were likewise raised in dysfunctional or overstressed families. The multigenerational nature of psychopathology has been widely recognized by clinicians, teachers, police, mental health researchers, and anyone else who frequently deals with these unhappy families and youth. Kumpfer (1987), in a major review of research on risks in children of substance abusers, pointed out the overlap of these children in most special social, educational, and medical services.

Family epidemiological research suggests that many psychiatric disorders run in the same families. At first, antisocial personality, substance abuse, and Briquet's syndrome with psychosomatic tendencies were found to be comorbid family diseases (Robins and Radcliff 1979). Recent analyses of the Epidemiological Catchment Area data suggest that anxiety disorder, borderline personality, narcissism, and depression are also part of this comorbid syndrome. Since early onset is often a sign of higher genetic loading for an emotional or behavioral disorder, Kumpfer (1994) suggested that early-onset delinquency as manifest in chronic career delinquents can be considered a "family disease." Aggressive subtypes of conduct disorders are believed to have underlying biological predispositions (Quay 1993).

The stability of these "predelinquent" characteristics should not seem such a mystery when one considers that genetics, family environment,

and the characteristics of their caretakers remain fairly stable. Children are socialized and learn their patterns of behavior, their values, and emotional responses within the context of the family. If they live in a nontraditional, counterculture environment, they will develop nontraditional norms (Richters and Cicchetti 1993*a*, *b*).

Based on family epidemiological research, the Epidemiological Catchment Area Study, which has been conducted for years at Washington University in St. Louis (Robins 1966, 1973), it is clear that pervasive family genetic and environmental factors impact children. Jessor and Jessor (1977) described the problem-prone behavior syndrome in youth; Wender (1989) called the grouping of antisocial personality, substance abuse, and Briquet's syndrome found in the same families the Unholy Triad; and Zucker and Fitzgerald (1996) discussed a "nested matrix of risk" facing disopportunitied families created by family drug use, severe parental and child psychopathology, poverty, educational underachievement, and a problematic social support structure. These biopsychosocial risks should be addressed holistically—not piecemeal.

To inform the development of the most effective prevention interventions, researchers need solid research data on the developmental trajectories of youth likely to develop problem behaviors. However, this task is made more difficult because longitudinal developmental research studies indicate:

- *Different causal processes.* Developmental trajectories characterized by chronic, early-onset conduct disorders and other psychopathologies are likely to have a different causal structure characterized by multiple risk factors and fewer protective factors (Dunst 1995).

- *Individual trajectories.* Behaviors that appear heavily problematic at one time interval may, by way of normal developmental processes, dilute for some individuals but remain sustained for others (Bingham et al., under review; Jessor et al. 1991; Zucker et al. 1995).

- *Uneven timing.* The timing of the emergence of individual and family risks and resulting developmental patterns is not constant, but varies by subpopulations such as by gender, family history, ethnicity, and social and family environment (Bingham et al., under review;

Blumstein and Cohen 1987; Loeber and Dishion 1983; Moffitt 1993*a, b*; Schulenberg et al., in press; Zucker et al., in press).

DEVELOPMENTAL TRAJECTORIES IN PROBLEM YOUTH

Etiology research on the causes of problem behaviors in youth strongly support the popular belief that a small percent of children are at high risk for many different problems (Howell 1995; Huizinga et al. 1994; Kumpfer 1987; Thornberry 1987). These problems include chronic substance abuse, delinquency, school failure, and teenage pregnancy. Substance abuse and antisocial behavior are highly correlated and share common factors (Uihlein 1994).

Longitudinal studies indicate that early aggressive, anxious, and antisocial behavior precedes and predicts subsequent abuse in both males and females (Block et al. 1988; Kellam et al. 1983; Loeber 1988; McCord 1979; Miller 1990; Windle 1990). Similarly, alcohol and other drug abuse before the age of 15 years predicts greater severity of conduct disorders, which are a predictor of early-onset substance abuse (Robins and Przybeck 1985). Longitudinal studies of delinquency find that early delinquency behaviors (petty theft, vandalism, fires, and fighting) generally precede substance abuse by several years (Thornberry 1994); hence, these problem behaviors can be used as markers of youth likely to become substance abusers.

The risks for substance abuse represented by early behavioral disregulation and gross environmental inadequacies is related to Moffitt's (1993*a*) argument that antisocial behavior in adolescence masks two distinct types of individuals: those whose conduct problems, including substance abuse, are "adolescent-limited" and those whose are "life-course-persistent." She proposes that children who exhibit antisocial behavior only during adolescence are both normal and adjusted; their behavior is believed to be the result of a "contemporary maturity gap" that encourages teens to mimic antisocial behavior in others. On the other hand, evidence suggests that lifecourse-persistent antisocial behavior and substance abuse result from an interaction of children's neuropsychological deficits and dysfunctional, criminogenic home and neighborhood environments (Moffitt 1993*a*). Although there is considerable debate about the pathogenesis and prevention of persistent antisocial behavior and substance abuse, these factors are emerging centrally in the literature, as are maternal lifecourse factors

such as welfare dependency, unemployment, and numerous, closely spaced pregnancies (Furstenberg et al. 1987; Offord et al. 1987).

Prenatal

A number of family-focused programs are beginning before the child is born in an attempt to reduce negative influences on the developing fetus, such as alcohol, other drug, and tobacco use; poor nutrition; trauma; and poor prenatal care, which has been related to lower birth weight and lower IQ in infants.

The effects of tobacco are particularly damaging to children's intelligence. Olds and Pettitt (1996) report a four to five point difference between the intellectual functioning of children born to women who smoked 10 or more cigarettes during pregnancy and children whose mothers did not smoke at all. Additionally, animal studies suggest that the adverse effects of smoking on subsequent intellectual functioning may be limited to the end of gestation, when nicotine receptors develop on the cerebral cortex. Taken together, these findings suggest that smoking reductions after midgestation, particularly if accompanied by improvement in prenatal diet, may be particularly effective in protecting the developing fetal brain by supplying the fetus with a greater abundance of nutrients and oxygen and reducing the cerebral cortex's exposure to nicotine (Olds et al. 1994).

There is a greater tendency for males to suffer from impairments in learning and language (Billingham 1982). These indications of greater male vulnerability to a range of neurological and intellectual deficits deserve attention, especially since they may be factors that help explain the greater incidence of antisocial behavior and substance abuse among males.

Infancy

Typical developmental trajectories of early-onset, multiple-problem youth include being a temperamentally difficult infant who is irritable, excitable, difficult to sooth, overreactive to many stimuli, resistant to developing regular cycles, awake more than other infants, developmentally delayed, and not securely attached (Kumpfer 1987). This unfortunate beginning is strongly associated with family risk factors such as genetic factors; lack of prenatal care and good diet; maternal tobacco, alcohol, and other drug use (Streissguth et al. 1995); postnatal

exposure to toxins (Schroeder and Hawk 1987); and physical head trauma, poor diet, and parental neglect and abuse (Rogosch et al. 1995; Widom 1989*a*). While some of these precursors are genetic, most can be ameliorated through supportive parenting. Frequently, the small percentage of adolescents who become chronic drug abusers and delinquents come from multiproblem families with mothers who are depressed, highly stressed (Zahn-Waxler et al. 1990), and poorly educated and who lack the skills to effectively parent any child and certainly not a genetically or environmentally damaged child. Pregnancies spaced less than 2 years apart and a large number of children (Tygart 1991) are related to increased developmental psychopathologies. Unless provided with natural or professional social support, because of neighborhood disorganization and migration of middle-class families from inner cities, children from low-income families are being raised without community support, social supports, and positive role models.

Childhood

During childhood, the individual risk factors for developmental psychopathology include academic failure, hyperactivity, sensation-seeking, peer rejection, and association with deviant peers because of rejection by more normal prosocial children as a consequence of their aggressive behaviors (Bierman and Wargo 1995). Possibly because of inept parenting and poor maternal and neighborhood monitoring, high-risk children rapidly escalate their coercive and early antisocial behaviors (i.e., lying, stealing, fighting, and noncompliance) (Ary et al., in press).

Patterson (1982) and Patterson and associates (1992) have long studied the parent-child processes that lead to increased coercion in children. Their research suggests that harsh and inconsistent parental discipline of early oppositional behavior shapes further aggression by a process of increasingly coercive interactions between the parents and the child. Additionally, the parents often become more inconsistent in their discipline and monitoring because they are trying to avoid these aversive discipline interactions. This avoidance can lead to a lack of parental monitoring of schoolwork and housework completion, activities with peers, and general behavior. Such research suggests that when a child makes his or her first request to do something, parents of coercive children say "No" about 80 percent of the time, whereas parents of normal children say "No" about 50 percent of the time. When the child

asks a second time, in a more coercive manner, the parents of delinquent kids cave in and agree; whereas other parents say "No" almost 100 percent of the time. The parent-child transactional process described above and its relationship to deviant peers has been found applicable to adolescent drug abuse (Dishion and Ray 1991; Dishion et al. 1988), high-risk sexual behavior (Metzler et al. 1995), as well as problem behavior in general, including academic failure (Tildesley et al. 1995; Ary et al., in press; Metzler et al. 1994).

Adolescence

In early adolescence, the behavior of these high-risk children includes alcohol, tobacco, and other drug use before the age of 15 years (Kumpfer 1987), which has been reported to predict greater severity of conduct disorder symptoms; that conduct disorder was a predictor of early onset of substance abuse (Robins and Przybeck 1985). Delinquency and arrest rates increase prior to substance use (Thornberry 1994); hence, if researchers could identify and intervene with conduct-disordered youth, the most severe types of substance abuse could possibly be impacted. Family-focused interventions have been found at all developmental stages to be more effective with at-risk youth than other types of interventions (Alexander and Pugh 1996). Early teens who display attention deficits, hyperactivity with aggression, and severe multiple problems are more likely to have alcohol abuse and criminal records by ages 18 to 23 (Lynskey and Fergusson 1995; Magnusson and Bergman 1988).

ECOLOGICAL MODELS: INTERRELATIONS AMONG RISK DOMAINS

Bronfenbrenner's (1979, 1992) process-person-context model, derived from human ecology theory, was adapted as a framework for integrating the diverse influences on development for substance abuse and other problem behaviors discussed in this chapter. This model is compatible with biopsychosocial models (Kumpfer et al. 1990) because it includes interactions among multiple domains of influence, such as family, community/culture, school, individual, and peers. Such research frameworks also allow for the influence of family genetic and other physiological or biological influences on substance abuse as shown in the developmental framework of the Values, Attitudes, and Stress

Coping (VASC) Model of Adolescent Substance Abuse proposed by Kumpfer and DeMarsh (1985).

Ecological models place more emphasis on the environmental context of families, such as poverty, neighborhood disorganization, and cultural impoverishment. Increases in dysfunctional caregiving (including neglect and inadequate socialization of self-control behavior) have been found when parents experience financial difficulties (Conger et al. 1992, 1993) and have larger families (Hirschi 1994). Similarly, poverty and unemployment rates and the child-to-adult ratio in a neighborhood are predictive of the child maltreatment rate (Coulton et al. 1995). In such cases, children's risks for antisocial behavior and substance abuse are further increased (Felner et al. 1995; Hirschi 1994; Moffitt 1993*a*, *b*).

Although these findings make it clear that the co-occurrence of family risk factors multiplies the risk for behavior problems and substance abuse (Bry 1982) if not offset by family protective or resiliency factors, it is not clear how this happens. While the domains of influence on delinquency, conduct disorder, and adolescent substance abuse, and the variables grouped within these domains, are sometimes seen as additive, they are more appropriately thought of as bidirectional and transactional (Alexander et al. 1995; Kumpfer and Bluth, in press). Research discussed in the section below is beginning to clarify the family processes or transactional relationships that can lead to problem behaviors in youth or the protective family processes that can lead to increased resilience to drug use in environmentally at-risk youth. (For a more indepth review, see Kumpfer and Bluth, in press.)

Gary and Booker (1992) suggest that although behavioral science theories have been useful in working with families, family researchers should also consider emerging theoretical orientations such as symbolic interaction, family lifecycle (family development), feminism, womanism, and Afrocentricity as useful in creating theories to inform drug prevention programs within the context of family dynamics (Abramovitz 1987; Akbar 1984; Asante 1991; Collins 1990; Nes and Iadicola 1989; Reinharz 1993; Staples and Johnson 1993). By considering these new conceptual frameworks, researchers may begin to address some important culturally sensitive and gender-relevant variables that have been ignored by the established social science community. Among the understudied variables currently being examined by Gary (1986) and others (Ahmed et al. 1984; Brown et al. 1990) are (1) spirituality and religiosity, (2) racial and cultural identity,

(3) racial discrimination as a stressor, (4) role of fine arts (music, dance, art, theatre) in human resilience, (5) gender identity, and (6) cultural hassles as stressors. The protective factors and risk factors should be added to resilience and vulnerability theories and tested in family prevention approaches.

RELATIONSHIP OF MATERNAL LIFECOURSE TO ANTISOCIAL BEHAVIOR AND SUBSTANCE ABUSE

Women's lifecourse development is strongly associated with developmental trajectories of their children and whether the children will develop antisocial behavior and abuse alcohol and other drugs (Olds and Pettitt 1996). In a longitudinal study of adolescent parents in Baltimore, for example, young women with recent welfare experience were more likely to report that their children had engaged in a variety of antisocial and delinquent behaviors, including substance use, than were their low-income, nonwelfare counterparts (Furstenberg et al. 1987). Being unmarried increased the likelihood that their children reported using alcohol, marijuana, cigarettes, and other drugs. Increased family size can lead to reduced parental influence, decreased parental supervision, less homework support and monitoring, fewer opportunities, and greater peer influence on both girls' and boys' development of antisocial behavior and substance use (Tygart 1991).

Low levels of maternal self-efficacy may compound the problems women encounter in effectively managing the challenges of daily living, resulting in additional difficulties in undertaking effective caregiving and monitoring of their children's behavior. Women with little sense of self-efficacy may also settle for intimate partners who compromise their efforts to provide stable family conditions for their children. Their partners may subvert their plans to obtain economic independence or to delay or avoid a subsequent pregnancy; they may expose the children to examples of and opportunities for delinquency and substance use; and they may help to create a climate in which academic success is less valued, thus undermining the development of their children's own sense of self-efficacy. These are important elements of what Moffitt has referred to as "criminogenic environments" (Moffitt 1993*b*).

RELATIONSHIP OF PARENTING OR CAREGIVER DYSFUNCTION TO ANTISOCIAL BEHAVIOR AND SUBSTANCE ABUSE

While almost all empirically tested models of substance abuse and other youth problems find that peer influence is the most proximal and final pathway to problem behaviors in adolescence, other social context variables such as school and family precede and predict the selection of antisocial and substance-using peers (Biglan et al. 1995; Kumpfer and Turner 1990/1991; Newcomb 1992; Swaim et al. 1990). Parent and intrafamily processes were consistently concluded to represent the best predictors of child behavior disorder (Farrington 1991; Loeber and Dishion 1983; Reid 1993) and the most appropriate targets for change in a multisystemic context (Alexander and Pugh 1996; Liddle and Dakof 1993). According to Alexander and Pugh (1996), "Certainly, the focus has moved from identifying general dispositional risk factors to prioritizing the importance of family factors in etiology of antisocial behavior."

Research using structural equation modeling (SEM) or latent cluster analysis help to clarify processes by which dysfunctional parenting or caregiving can result in youth associating with antisocial peers. The Social Ecology Model of Adolescent Substance Abuse (Kumpfer and Turner 1990/1991) tested on over 1,800 adolescents suggests that family conflict and poor parent/child relationships are associated with poor school climate. Both of these factors result in reduced school attachment and reduced self-esteem and self-efficacy. These variables mediate association with antisocial and substance-using peers. The developmental model of antisocial behavior advanced by Patterson and colleagues (Patterson and Bank 1989; Patterson et al. 1991, 1992), further clarified that poor family management practices (especially coercive interactions and poor monitoring) explained involvement with deviant peers.

Poor family management, lack of parenting skills, and dysfunctional caregiving have been strongly related to chronic substance abuse and delinquency. Dysfunctional caregiving generally refers to the inadequate parental provision of material and emotional care for children (Olds and Pettitt 1996). The abuse and neglect of children represents the extreme of such dysfunction. Abused and neglected children are at increased risk for early and persistent behavior problems and substance abuse (Downey and Coyne 1990; Eckenrode et al. 1993; Hussey et al. 1992; Kaufman

and Cicchetti 1989; Kolko et al. 1990; National Research Council 1993; Raine et al. 1994; Widom 1989*a*, *b*; Yoshikawa 1994; Zahn-Waxler et al. 1990). Other aspects of dysfunctional caregiving associated with children's substance abuse include various family management practices such as inconsistent parental discipline and inadequate parental monitoring (Dishion et al. 1995; Hawkins et al. 1992).

However, the mechanisms by which dysfunctional caregiving leads to substance abuse and other problem behavior are still unclear. Gottfredson and Hirschi (1990) argued that poor parenting practices failed to instill within the child the capacity for impulse regulation and empathy, increasing the risk for adolescent criminal behavior, including substance abuse. Moreover, inadequate supervision of children may increase children's exposure to deviant peers (Dishion et al. 1995) and their opportunities for using alcohol and other drugs.

Empirically tested longitudinal models of causes of substance abuse using SEM suggested that family conflict and lack of positive family involvement at time 1 lead to reduced parental monitoring and supervision at time 2. This lack of supervision is related to involvement with deviant peers at time 2, which is related to time 3 problem behaviors such as antisocial behavior, high-risk sex, academic failure, and substance use (Ary et al., in press).

FAMILY CORRELATES OF SUBSTANCE ABUSE AND OTHER YOUTH PROBLEMS

Depending on the level of functioning, families can negatively impact a child's development. While there is no single cause of substance abuse, family variables are a consistently strong predictor of antisocial behaviors (McCord 1991; Tolan and Loeber 1993; Tolan et al. 1995). Parents and peers are the strongest risk factors for delinquency, according to the study of causes and correlates of delinquency (Thornberry et al. 1995). Several empirically tested models of delinquency and substance abuse found that parent-child relationships or processes such as support and supervision are the precursors of peer influences—the final pathway to delinquency (Ary et al., in press; Kumpfer and Turner 1990/1991). In other words, youth who like and respect their traditional parents are less likely to become involved with antisocial peers and delinquency.

Loeber and Stouthamer-Loeber (1986) conducted a meta-analysis of approximately 300 research studies. In longitudinal studies, socialization factors (e.g., lack of supervision, parental rejection of the child and child rejection of the parent, and lack of parent-child involvement) were found to be the strongest predictors of delinquency. Parental dysfunction, such as criminality and poor marital relations, were midlevel predictors, and parental health and absence were weak predictors. In concurrent comparative studies, the strongest correlate of problem behaviors in children and youth was the child's rejection of the parents and/or the parent's rejection of the child. The importance of effective parental discipline was higher in these studies than in the longitudinal studies. The effects of these risk factors appear to be the same for boys and girls.

From this and other reviews (Hawkins et al. 1994; Kumpfer and Alvarado 1995; Wright and Wright 1992; Zucker et al. 1995), as well as other primary sources, a list of family correlates of substance abuse can be assembled:

- Family history of the behavior problem, including parental or sibling role modeling of antisocial values and drug-taking behaviors and favorable attitudes about drug-taking behaviors (Hawkins and Catalano 1992) and parental criminality, psychopathology (Offord 1982; Robins 1981), and antisocial personality disorder and substance abuse (Faraone et al. 1991; Frick et al. 1992)

- Poor socialization practices, including failure to promote positive moral development (Damon 1988); neglect in teaching life, social, and academic skills to the child or providing opportunities to learn these competencies; and failure to transmit prosocial values and disapprove of youth's use of alcohol or other drugs (Dielman et al. 1989)

- Ineffective supervision of the child, including failure to monitor the child's activities (Ary et al., in press), neglect, latchkey conditions, sibling supervision (Steinmetz and Straus 1974), and too few adults to care for the number of children

- Ineffective discipline skills, including lax, inconsistent, or excessively harsh discipline (Jones and Houts 1990), parental behavioral undercontrol or psychological overcontrol of the child (Barber 1992; Garber and Robinson 1995), expectations that are unrealistic for the developmental level of the child creating a failure

syndrome (Kumpfer and DeMarsh 1985; Reilly 1992), and excessive, unrealistic demands or harsh physical punishment (Cohen and Brook 1987)

- Poor parent/child relationships, including lack of parental bonding and early insecure attachment (Baumrind 1985; Lyons-Ruth et al. 1993); repeated loss of caretakers (Loeber 1990); negativity and rejection of the child by the parents (Brook et al. 1990; Cole and Zahn-Waxler 1992), including cold and unsupportive maternal behavior (Shedler and Block 1990); lack of involvement and time together (Kumpfer and DeMarsh 1985), resulting in rejection of the parents by the child; and maladaptive parent/child interactions

- Excessive family conflict and marital discord (Katz and Gottman 1993) with verbal, physical, or sexual abuse (Kumpfer and Bayes 1995)

- Family disorganization, chaos, and stress often because of poor family management skills, life skills, or poverty (Tolan et al. 1993)

- Poor parental mental health, including depression and irritability, which cause negative views of the child's behaviors, parental hostility to child, and harsh discipline (Conger and Reuter, in press)

- Family isolation, lack of supportive extended family networks (Dilworth-Anderson 1992), family social insularity (Dumas 1986), and lack of community support resources

- Differential family acculturation and role reversal or loss of parental control over adolescents by parents who are less acculturated than their children (Delgado 1990; Szapocznik et al. 1986)

RESILIENCY AND PROTECTIVE FAMILY FACTORS AND PROCESSES

Gary and Booker (1992) recommended that the prevention field be more focused on a family strengths perspective rather than the traditional risk and deficit perspective. This paradigm shift has been stressed for over 30 years by African-American and other scholars (Billingsley 1992, 1968; Gary et al. 1983; Hale-Benson 1986; Hurd et al. 1995; Royse and Turner 1980). According to Wilson and Tolson (1988), "The most

significant trend in Black family research is the shift from a deficit to a strengths view." Gary's research with African American families has clarified some of the protective processes in African-American families that build resilience in youth in high-risk environments and neighborhoods. The characteristics of strong families in his study were (1) a strong economic base, (2) achievement orientation, (3) role adaptability, (4) spirituality, (5) extended family bonds, (6) racial pride, (7) respect and love, (8) resourcefulness, (9) community involvement, and (10) family unity (Gary et al. 1983).

Risk factors are not the total story. It is important to understand that the probability of a child developing problems increases rapidly as the number of risk factors increases (Rutter 1987, 1990; Sameroff et al. 1987) only in comparison with the number of protective factors (Dunst and Trivette 1994; Rutter 1993). Children and youth generally are able to withstand the stress of one or two family problems in their lives; however, when they are continually bombarded with family problems, the probability of them becoming substance users increases (Bry et al. 1982; Newcomb and Bentler 1986; Newcomb et al. 1986).

The protective factor model of prevention provides a nondeficit, non-problem-centered framework and is heavily influenced by the strengths perspective of social work and mental health (Gary and Booker 1992). The purpose of the strengths perspective is to ensure that professionals pay attention to client strengths in implementing intervention programs. According to Saleebey (1992), the strengths perspective asks the professionals or persons designing the intervention programs to be "guided first and foremost by a profound awareness of and respect for clients' positive attributes and abilities, talents, and resources and aspirations." (p. 6)

A complete discussion of the research on family protective processes is beyond the scope of this chapter (for a complete review, see Kumpfer 1994 and Kumpfer and Bluth, in press). Briefly, family protective factors include one caring adult (Werner 1986; Werner and Smith 1992), emotional support, appropriate developmental expectations, opportunities for meaningful family involvement, supporting dreams and goals, setting rules and norms, maintaining strong extended family support networks, and other protective processes. Newly created family interventions, such as the Iowa Strengthening Families Program (Molgaard and Kumpfer 1995), are increasingly based on enhancing family strengths and resilience.

INTERACTION OF RISK AND PROTECTIVE FACTORS AND PROCESSES

Research data from the Office of Juvenile Justice and Delinquency Prevention Program of Research on Causes and Correlates of Juvenile Delinquency from three longitudinal studies in Denver, Colorado, Rochester, New York, and Pittsburgh, Pennsylvania, suggest that risk factors are not simply additive, but interact to produce higher levels of risk burden (Thornberry 1994). Additionally, they are moderated by protective factors in the family or youth environment and internal resiliency factors or processes (Kumpfer 1995; Kumpfer, in press). If youth had only 1 of the 12 protective factors identified, the reductions in delinquency were negligible; however, if there were multiple protective factors (9 or more), the risk of delinquency was reduced to below 25 percent.

The Pittsburgh site identified three major developmental pathways to delinquency: (1) the authority conflict pathway, (2) the covert pathway, and (3) the overt pathway. In each case, the parents or caretakers involved with the youth support or hinder these developmental pathways or sustained trajectories. The authority pathway is characterized by defiance of parental authority; the covert pathway by lack of parental supervision and monitoring leading to burglary, car theft, and fraud; and the overt pathway by the development of a coercive cycle of aggression and violence within the family (Patterson et al. 1989). Lack of supervision and monitoring appears to be particularly salient as a cause of violent offenses. Violent crimes peak just after the close of school at about 3:00 p.m. (Snyder and Sickmund 1995), suggesting lack of parental supervision and latchkey status. The Carnegie Council on Adolescent Development (1994) study found that about 40 percent of adolescents' nonsleeping time is spent alone, with peers without adult supervision, or with adults who might negatively influence their behavior.

SUMMARY OF ETIOLOGICAL RESEARCH IN DEVELOPMENTAL PSYCHOPATHOLOGY

Oetting, who is completing a major review of etiology for substance abuse, stated at a National Institute on Drug Abuse (NIDA) conference on rural substance abuse: "The biggest risk and protective factor is the family. It is the foundation" (Oetting 1996). It appears that three major

aspects of family interactions are critical: (1) family attachment, bonding, and affective relationships; (2) guidance through supervision and support in making good friends; and (3) the transmission of norms and skills through discussions and role modeling. Additional research is needed to better understand the most critical family processes that protect youth and reduce risk.

Although prevalent mythology assures parents that they are not responsible for their adolescent's actions because peers are the primary influences, research suggests that family influences remain roughly comparable with peer influences for quite some time (Loeber 1990). In fact, in the areas of substance abuse, which typically develops several years later than delinquency, research by Coombs and associates (1991) suggested that the primary reason for a youth to use drugs is peer influence; however, the primary reason not to use drugs is parental disapproval. Hence, it is possible that research with prosocial youth would show that parental influence is still the primary influence during adolescence. This does not mean that these prosocial youth do not make their own decisions; if they had to choose between parental or peer wishes, they would more likely follow the recommendations of their parents.

Implications for Prevention

One major implication of this emerging developmental research for preventive interventions is that youth from multiproblem families and environments require different intervention strategies than those with later onset and lower risk burdens (Schulenberg et al., in press; Weber et al. 1989; Zucker and Fitzgerald 1996). Interventions for early-onset, multiproblem youth must take into account the multidetermined nature of developmental psychopathology (Borduin et al. 1995). Thus, investigators mounting new prevention or treatment intervention efforts need to carefully specify (and justify) ages or stages for specific intervention programming; consider the most salient domains of risk influence (family, school, peers, media, or individual); and consider the degree to which a problem at any stage is really a product of current influences or primarily a "downstream" manifestation of prior influences at an earlier time.

Sequentially identifying and attempting to modify each variable in isolation is not a very promising strategy. An additional issue is that some genetic, biological, and large community/social risk variables are

not very amenable to change even in the most well-funded intervention. Thus, it is often difficult to remove (in ways comparable to surgery or radiation) such risk variables from the child or remove the child from the environment without incurring excessive cost or inflicting damaging effects. However, modifying mediators, such as parenting and family environment, which have a pervasive and sustained influence on many risk mediators, can reduce the likelihood that moderators we cannot impact directly (media, neighborhood disorganization) will continue to influence deviant behavior. This requires that researchers see beyond a static, multivariate model of change to a more dynamic, phasic, and developmental model of change, all informed by rigorous etiological and intervention research.

Zucker and Fitzgerald (1996) state that a "failure to appreciate these issues has led to the proliferation of intervention models that are either not relevant to that segment of the population for families at greatest risk, or that lead to significant, but clinically meaningless, effects." (p. 3) These insufficient interventions have very small effect sizes rendered statistically significant by using power analyses to justify very large sample sizes. Despite statistical significance, they are clinically nonsignificant (Jacobson and Revenstorf 1989), or are epiphenomena in staying power, because they rapidly are diluted by an ecological context that washes away effects. Hence, doing too little is done too late.

Additionally, and more problematic, is the implication that the most desirable age for targeted interventions almost certainly varies across population subgroups and individuals. Hence, one approach would be to assess each individual and determine the appropriate interventions tailored for the specific risk and protective processes in the youth and family. This is a rather expensive and intrusive process. Another approach would be to conduct universal prevention approaches involving all youth. Unfortunately, these interventions rarely address the multitude of risks with sufficient dosage of multiproblem youth to make much of a dent in the risk burden. A hierarchical strategy of multiple gating that moves youth through the phases of prevention (Institute of Medicine 1994) from universal interventions to selective and eventually to indicated interventions has been recommended.

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AUTHORS

Karol L. Kumpfer, Ph.D.*
Director
Center for Substance Abuse Prevention
Substance Abuse and Mental Health Services Administration
Rockwall II Building, Ninth Floor
5600 Fishers Lane
Rockville, MD 20857

David L. Olds, Ph.D.
Professor of Pediatrics
Director
Prevention Research Center for Family and Child Health
University of Colorado Health Sciences Center
Suite 200
303 East 17th Avenue
Denver, CO 80203

James F. Alexander, Ph.D.
Professor
Department of Psychology
University of Utah
1329 BEH S
Salt Lake City, UT 84112

Robert A. Zucker, Ph.D.
Professor of Psychology
Director
Alcohol Research Center
University of Michigan
Suite 2A
400 East Eisenhower Parkway
Ann Arbor, MI 48108-3318

Lawrence E. Gary, Ph.D.
Professor
School of Social Work
Howard University
601 Howard Place, NW
Washington, DC 20059

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*When this meeting was held, Dr. Kumpfer was Associate Professor in Health Education, Department of Education, University of Utah, Salt Lake City, UT.

Family-Focused Substance Abuse Prevention: What Has Been Learned From Other Fields

Karol L. Kumpfer, James F. Alexander, Lynn McDonald, and David L. Olds

INTRODUCTION

Families are the primary institution for raising children who are the future of any society. Family socialization processes are the primary predictors of children's behavior. The importance of family risk and protective processes in the development of drug abuse and dependency is acknowledged in most empirically tested, multicausal etiological models of substance use (Ary et al., in press; Brook et al. 1990; Kumpfer and Turner 1990/1991; Newcomb and Bentler 1989; Swaim et al. 1990). Because of the importance of strong families, more research-based, family-focused interventions are needed in addition to the popular school- and peer-focused interventions.

With increasing breakdown of the family worldwide (Kumpfer 1996), the media, the general public, policymakers, and prevention researchers and practitioners are becoming more interested in supporting family-strengthening interventions. In addition, meta-analyses of prevention efforts with delinquent and drug-abusing youth suggest that the single most effective form of prevention involves working with the total family system. Interventions aimed at youth often have fewer lasting effects than family-focused prevention interventions. Meta-analytic studies suggest that the effect sizes for family interventions are among the largest of all interventions with high-risk and delinquent youth (Andrews et al. 1990; Gordon et al. 1988).

Fear of drug-abusing and violent juveniles has resulted in many Americans curtailing their activities and living in fear. Politicians have responded quickly, but typically with less than effective, short-term solutions, such as increased funding for policing, supply reduction strategies, and incarceration. According to a Peter Hart Research poll, 47 percent of police chiefs want more efforts in substance abuse education, prevention, and treatment compared with only 21 percent of

police chiefs who gave a higher priority to law enforcement strategies. Many prominent corrections specialists, then, agree with prevention specialists that longer term solutions are required to prevent substance abuse and delinquency. Many citizens believe it is critical to strengthen America's families, schools, and communities.

Added to this litany of family problems are impending funding cuts for support services to low-income families. According to a National League of Cities (NLC) survey, called *Critical Needs, Critical Choices: A Survey of Children and Families in America's Cities*, more than 75 percent of all cities say recent changes in Federal and State funding cuts will have a moderate to major negative impact on their municipal agendas for supporting families and children.

PURPOSE OF THIS CHAPTER: INTERDISCIPLINARY COLLABORATION

Because of increasingly nested and tenacious problems facing multiproblem families today (Zucker and Fitzgerald 1996), members of the scientific community must learn from one another's research to make significant strides in creating family-focused interventions powerful enough to diminish these family issues.

The purpose of this chapter is to synthesize the presentations given at the January 25-26, 1996, National Institute on Drug Abuse (NIDA) research meeting on Drug Abuse Prevention Through Family Interventions. These research findings represent results from several disciplines (e.g., psychology, psychiatry, social work, health education, sociology, and pediatrics) and help inform family-focused prevention research and practice.

Unfortunately, although more researchers are attending interdisciplinary conferences and reading journals of other fields, academically based researchers tend to associate with colleagues from similar academic departments. Each discipline tends to view family problems from its own biomedical, psychological, or sociological perspective. Researchers are all examining the multiproblem family, yet insights, findings, and solutions are rarely shared. In such cloistered circumstances, cross-fertilization of ideas is reduced as is the application of different theories and methodological approaches to solving the growing real-life problems facing families in society.

Additionally, because of the nature of categorical funding, researchers and practitioners specializing in substance abuse rarely interact with prevention researchers specializing in other fields (e.g, delinquency, child abuse and neglect, special education, teen pregnancy, HIV/AIDS, runaway and homeless youth, child welfare, family support, and early childhood education). Sharing of findings across these fields would help advance knowledge of effective interventions for multiproblem youth. More colocation of conferences and incentives for collaboration are needed to bridge this specialty field gap.

Whether medical folklore or reality, the story of how treatments for childhood cancers such as leukemia were developed through multidisciplinary teamwork holds a promising vision of the effectiveness of collaborative research efforts. By dealing with multiple risk factors simultaneously and mounting a major effort across disciplines, oncologists discovered that conducting simultaneous treatments (surgical, radiological, chemotherapeutic, dietary, and psychological) produced synergistic and longer lasting effects with sufficient dosage to cure the problem. To successfully prevent substance abuse, practitioners and researchers from many different fields share knowledge and work together to develop more effective family-focused prevention and treatment interventions, which are producing promising results. Hopefully, by continuing interdisciplinary symposiums on family intervention research and fostering interdisciplinary collaboration, researchers can share their collective wisdom to create even more effective treatments to prevent or reduce developmental psychopathologies in youth often associated with family dysfunction.

Because of the large numbers of youth being raised in dysfunctional families and poverty, researchers' academic rivalry and professional competitiveness must be put aside to allow for collaborative work.

This chapter combines ideas from the data of researchers from different academic disciplines presented within the panel "What Have We Learned From Other Fields, e.g., Juvenile Delinquency, Mental Health, That Can Be Applicable to Drug Abuse Prevention Intervention Research?" The papers, authors, and institutions included:

- "Reducing Risks for Substance Abuse With a Program of Prenatal and Early Childhood Home Visitation"—David Olds and Lisa Pettitt, Department of Pediatrics, University of Colorado and Department of Psychology, University of Denver

- "Family-Based Treatment of Adolescent Delinquency, Conduct Disorder, and Related Patterns of Acting Out: Empirically Informed Recommendations"—James F. Alexander, Department of Psychology, University of Utah

- "Families and Schools Together (FAST) Program: A Substance Abuse Prevention Program Which Clusters Families Under Stress for Social Support"—Lynn McDonald, Department of Psychiatry, University of Wisconsin

This chapter focuses on what can be learned from prevention and treatment intervention research in many different fields addressing problems of families and youth concerning the most effective interventions. The chapter discusses the Institute of Medicine (IOM) (1994) categorical scheme of universal, selective, and indicated prevention programs, based on the suggestions of Gordon (1987).

Additionally, research on model family programs is covered to provide a variety of examples of different types of family-focused prevention approaches for each of the developmental stages. The model programs include (1) the nurse home visitation program developed by Olds and associates (1986) in pediatrics for prevention of physiological, cognitive, and emotional damage in infancy due to maternal substance use and faulty caregiving; (2) the FAST program developed by McDonald and associates (McDonald et al. 1996) in psychiatry and social work for 4- to 9-year-olds; and (3) the Functional Family Therapy (FFT) program of Alexander and Parsons (1982) in psychology for delinquent youth. The chapter ends with a discussion of issues in developing, testing, and disseminating family intervention for prevention of problems in youth and families.

FAMILY INTERVENTIONS FOR THE PREVENTION OF SUBSTANCE ABUSE

This section provides an overview of the different types of prevention interventions—universal, selective, and indicated prevention strategies—as well as an overview of the effectiveness of the different types of family interventions. The section ends with a discussion of research, intervention, and dissemination issues.

Types of Prevention Interventions

While prevention programs have traditionally been organized into a continuum of primary, secondary, and tertiary prevention programs, the increased emphasis on creating prevention programs that match the risk needs of specific groups or individuals requires a more precise prevention classification scheme. The new prevention continuum adopted by the Institute of Medicine (1994) is based on the terminology recommended by Gordon (1987). It includes a finer breakdown of primary prevention into universal, selective, and indicated prevention interventions. In this scheme, the prevention category is determined by the group or individual for whom the program is designed and their risk factors (Lorion et al. 1989).

Universal interventions are applied to the general population of families and youth. Examples are school-based programs, media campaigns, and community interventions targeting strengthening families to prevent drug use, such as the Preparing for the Drug-Free Years Program (Hawkins et al. 1996), FAST (McDonald 1996), the first phases of the Adolescent Transition Program (Dishion and Kavanagh, in press), and the Iowa Strengthening Families Program (Molgaard and Kumpfer 1995).

Selective prevention interventions, in contrast to universal prevention interventions, target high-risk individuals or families as members of at-risk subgroups. Hence, these families are targeted not because of specific individual needs assessments or diagnoses, but because of epidemiologically or empirically established risk factors, such as (1) demographic risk factors, (2) psychosocial environmental risk factors, and (3) biological genetic risk factors. These family interventions generally last longer, are more intrusive by involving parent and youth in ways to target behavioral changes, and therefore, work with smaller numbers of participants per group. Examples of selective family prevention interventions are the Strengthening Families Program (Kumpfer et al. 1989) for substance-abusing families and other culturally modified versions for high-risk African American families (Aktan 1995; Aktan et al. 1996), Spanish-speaking families, and Asian/Pacific Islander families. (For an overview of all versions see Kumpfer et al. 1996; Kumpfer et al. 1997*a*.)

Indicated prevention programs are designed to address the multiple risk factors in dysfunctional families. The families are typically referred for the family intervention because of some indicated problem in the family.

These identified or diagnosed problems may include school failure, delinquency, noncompliance or drug use in the child or indicators of parenting dysfunction such as child physical or sexual abuse, severe neglect, or other parental pathology. Indicated prevention programs are even more intrusive and longer and can involve inhome therapeutic or family support sessions such as those in family preservation programs and some family services or family case management programs. Often they involve individual rather than group sessions with a highly trained therapist. Discussed in this chapter are the prenatal and infancy nurse home visitation program (Olds et al. 1997*a*) and the FFT program (Alexander and Parsons 1982).

Alexander and Pugh (1996) clarified that many indicated family-focused prevention programs are categorized as both prevention and treatment. For instance, the family therapy programs are considered therapeutic for conduct disorders in the child or for severely dysfunctional parenting. However, they are still categorized as indicated prevention programs if the child is not currently a substance abuser, because they are effective in preventing the developmental progression from conduct disorders to drug abuse. Examples of indicated family interventions include: structural family therapy (Szapocznik et al. 1988) and FFT (Alexander and Parsons 1982), systems behavioral family therapy (Gordon et al. 1988), multidimensional family therapy (Liddle 1995), multitarget ecological treatment (Chamberlain and Rosicky 1995), and multisystemic family therapy (Henggeler and Borduin 1990; Henggeler et al. 1992).

Thus while dichotomizing discussions, funding initiatives, intervention programs, and relevant literatures into categories of prevention and treatment can be useful, it can also be misleading if they are seen not as a continuum but as dichotomous alternatives. The success of FFT in also reducing the offending rates among younger siblings of youth participating because of delinquency records (Klein et al. 1977) demonstrates the difficulty of categorizing programs as prevention or treatment even within a single family.

The next sections highlight three family interventions not discussed in the prior chapters. Each of these substance abuse prevention programs illustrates an effective family-focused approach appropriate for the three major developmental stages of children (i.e., prenatal and early childhood, childhood, and preteen and adolescence). In addition, each of these three programs represents, in order, examples of a universal, a

selective, and an indicated approach to prevention. The model programs discussed include (1) the nurse home visitation program developed by Olds and Pettit (in press), (2) the FAST program developed by McDonald and associates (1996), and (3) the FFT program of Alexander and Parsons (1982).

EARLY CHILDHOOD FAMILY INTERVENTIONS

Greater emphasis is being placed on helping families early when the child is between birth and 5 years of age—even prior to birth. Research has suggested that decreasing tobacco, alcohol, and other drug use in pregnant women can have benefits in reducing later substance abuse in both the mother and the child.

To the extent that pregnant women avoid substance use during pregnancy, such as cigarette smoking, alcohol consumption, and use of illicit drugs, and thus protect their children's health in utero, children's cognitive (especially language) and behavioral functioning are more likely to follow a normal developmental track by the time they are 3 to 4 years old (Lester and Tronick 1994; Olds et al. 1994*b*; Weitzman et al. 1992). Children of women who engage in these behaviors during pregnancy are at risk for neurodevelopmental impairment (Jacobson et al. 1993; Mayes et al. 1995; McGee and Stanton 1994; Olds et al. 1994*a*, *b*; Streissguth et al. 1984, 1995; Weitzman et al. 1992).

Neurodevelopmental impairment in turn is reflected in deficits in verbal and executive functions, such as problem solving, receptive listening, attention span, and impulse control, which are predictors of conduct disorder and substance abuse (Hawkins et al. 1992; Moffitt 1990, 1993; Moffitt and Silva 1988; Pennington and Ozonoff 1996).

Family-focused preventions being tested to prevent problems in newborns to 5-year-olds include nurse home visitation trials (Olds et al. 1997*a*), family services and family support (Yoshikawa 1994), family paraprofessional case management programs (Kumpfer et al. 1995), infant stimulation, toy making, and language development support in the home by trained staff and programs to reduce conduct problems in 3- to 5-year-olds (Maguin et al. 1994; Nye et al. 1995). Despite the popularity of these programs, because of the newness of this approach, the research evidence is still accumulating concerning the effectiveness of these complex and often multicomponent programs. Overall, the results to

date look very promising (Yoshikawa 1994). One of the programs with the strongest results is the nurse home visitation program developed by Olds and associates (Olds et al. 1997*b*).

UNIVERSAL PREVENTION: THE NURSE HOME VISITATION PROGRAM

The nurse home visitation program was developed by Olds and associates to reduce biological damage during prenatal development and infancy due to exposure to toxins such as tobacco, alcohol, and other drugs resulting in fetal alcohol or drug syndrome or effect (Streissguth et al. 1984, 1995), poor maternal nutrition, accidents and head trauma, and maternal stress. The program studied in the Elmira and Memphis trials consisted of nurse home visits at least once every 2 weeks at first, which are phased out over time. In the Memphis site, a paraprofessional home visitor model was also tested against the professional nurse model.

The nurse home visitation program model has resulted in reduced rates of dysfunctional caregiving, as reflected in reduced rates of State-verified cases of child maltreatment (reduced from 10 to 4 percent in experimental families with nurse visits to 2 years) and healthcare encounters for injuries and ingestion (Olds et al. 1986, 1995*a, b*), in women's greater involvement with their children, and in indicators of mothers' use of consistent discipline techniques. Moreover, during the 2-year period after the program ended, children from nurse-visited families overall were much less likely to be seen in the physician's office for injuries, ingestions, or social problems and had 35 percent fewer visits to the emergency department. The nurse-visited parents were more involved and attuned to their children's needs and created safer home environments for them (Olds et al. 1997*c*).

The nurse-visited women were observed to be more involved with their children during in-home observations at the third year of the child's life and engaged in more appropriate, coherent punishment of their children. This improved the child's adaptive functioning and lessened severe punishment leading to physician visits for injuries during the fourth year (Olds et al. 1994*a*).

Evidence from randomized trials of prenatal and early childhood nurse home visitation indicates that nurse home visitation can reduce prenatal cigarette smoking and alcohol consumption and that intellectual

impairment among 3- and 4-year-olds associated with prenatal cigarette smoking can be eliminated (Kitzman et al. 1997; Olds et al. 1994*b*). In addition, these findings suggest that this program can reduce one's risk for lifecourse-persistent conduct disorder and substance abuse because of its success in reducing the rates of adverse prenatal health-related behaviors, such as smoking and alcohol consumption, while simultaneously improving prenatal diet (Kitzman et al.1997; Olds et al. 1986, 1995*a*).

This improvement in intellectual functioning was not explained by the reduction in preterm delivery or improvement in birthweight of infants whose mothers smoked during pregnancy (Olds et al. 1986), but rather appeared to be connected directly to the reduction in cigarette smoking and improvement in diets of mothers (Olds et al. 1994*b*).

Rates of subsequent pregnancy were 43 percent lower, participation in the workforce was 84 percent higher, and dependence on Aid to Families with Dependent Children (AFDC) was lower in low-income, unmarried women. Preliminary analyses of the first 75 percent of the Elmira 15-year followup sample indicate continued reductions in AFDC dependence and family size for nurse-visited, low-income, unmarried women (Olds et al. 1997*c*). These women were also less likely to be in relationships with men who were unemployed, in contrast to their comparison-group counterparts.

In the Memphis study, where the sample was 92 percent African-American, 97 percent unmarried, and all low income, nurse-visited women had 26 percent fewer repeat pregnancies and 9 percent fewer live births by the time the first-born children were 2 years of age. Nurse-visited women with high levels of psychological resources (highest tertile in IQ, mental health functioning, and active coping styles) reported 29 percent fewer months on AFDC than did their counterparts in the comparison group.

Based on this effectiveness in supporting healthy development in early childhood, the nurse home visitation program has been selected (along with other well-researched programs) for dissemination by an Office of Juvenile Justice and Delinquency Prevention (OJJDP) expert panel of the Strengthening America's Families technology transfer initiative. Two other programs include McDonald's FAST program for elementary school children and Alexander and Parsons' FFT. Each of these model family interventions is discussed below.

SELECTIVE PREVENTION: THE FAST PROGRAM

The FAST program was created in 1987 in response to a request for proposal (RFP) issued by the United Way of Dane County to reduce the increasing numbers of children who were having problems with substance abuse and community violence in their local area. This selective prevention program was designed to address prevention issues for high-risk youth early, creatively, and effectively before problems became too big.

The program sought to decrease the likelihood of long-term adolescent problems in 5- to 9-year-old children whom teachers identified as being at risk for school failure or suspension, involvement with the court system because of conduct disorders, or addiction to alcohol or other drugs. FAST also sought to have more intermediate impact on more proximal outcomes, such as reductions in behavior problems at school, including conduct disorder, motor excess, short attention span, and anxiety or withdrawal. Family objectives included increased family closeness and decreased social isolation.

Originally FAST was developed for 5- to 9-year-olds (and their families), but it was modified for Head Start/preschool children and their families with universal referrals (i.e., whole classrooms) and with high-risk, middle-school youth and their families with selective acceptance (i.e., FAST can refuse a referral).

The three phases of the FAST program are (1) outreach recruitment with home visits, (2) eight weekly 2½-hour multifamily meetings with a graduation at the last meeting, and (3) 2 years of monthly multifamily meetings run by FAST parents for maintenance and social support networks. These sessions provided a meeting for the whole family unit as well as separate sessions for adults and youth. Families participated in experiential programming with direct practice. Program components (activities) developed or expanded behavioral repertoires so parents became more in charge of their children. There were no formal presentations. Families had fun, communicated more effectively, and made positive inquiries, and parents were coached to block conflict or criticism. Family members made new friends at a peer level. The sessions were run by a team of representatives from the school, mental health agency, substance abuse prevention agency, and the parent/consumer constituency.

FAST Results

There has been continuous evaluation of the FAST program since 1988 with United Way and Center for Substance Abuse Prevention (CSAP) funding. Standardized measures include a family measure including FACE II (Family Adaptability and Cohesion Evaluation Scales version 2), Abidin Social Isolation Scale, and Epstein Parent Involvement Scale. Only a very small sample (N = 9) was a part of this initial experimental design study, but FAST received NIDA funding for a full-scale clinical trial. The findings revealed clinically significant but not statistically significant improvements in FAST children compared with controls. Repeated implementation across diverse settings showed a similar pattern. Nationally, 58 sites in 20 States have replicated FAST. In 30 sites in Wisconsin, analyses showed statistically significant improvement pre- and post-FAST by teacher and parent reports on standardized, valid, and reliable instruments. Clinical amount of change was an improvement of 25 percent. Overall, 80 percent of children improved over the 8 weeks. The FAST program followed parent graduates longitudinally for 2 to 4 years after involvement and found ongoing improvement on a standardized instrument of mental health called the Revised Behavior Checklist (RBPC). Parent empowerment practices affected parent involvement in school, self-referral to counseling or substance abuse treatment, returning to work or school, and becoming community leaders.

INDICATED PREVENTION: FFT

The FFT model was developed over the past 25 years as an empirically grounded, family-based intervention program for acting-out and delinquent youth. As such, this family therapy model was an example of an indicated prevention program for substance abuse (Institute of Medicine 1994). Several meta-analyses have shown that family therapy produced consistently moderate to large effect sizes (Hazelrigg et al. 1987). The FFT approach, which combines behavioral and cognitive social learning and family systems concepts, was developed and tested with "soft" delinquents (first-time status offenders) by Alexander and Parsons (1982). Using FFT, recidivism was cut in half (or better) (Alexander and Parsons 1973), and siblings showed half the recidivism rates (Klein et al. 1977).

Research suggests that families of delinquents have more defensive and less supportive communication patterns (Alexander 1973). A major goal of FFT was to improve family communication and supportiveness. Other goals were to help family members identify what they desired from each other and possible solutions to family problems.

The model was originally designed to provide intervention and treatment to middle-class families with delinquent and predelinquent youth. Much of the work included multiethnic, multicultural populations in both urban and rural populations.

The FFT family intervention model had five phases: (1) introduction/ impression, (2) motivation (therapy), (3) assessment, (4) behavior change, and (5) generalization (more focused multisystem) (Alexander and Parsons 1982). The intervention involved a strong cognitive/attributional component, which was integrated into systematic skill training in family communication, parenting skills, and conflict management skills. The program was conducted by family therapists working with each individual family in a clinic setting, which was standard for most family therapy programs.

Research Results

The FFT model received its first formal, comparative evaluation in 1971 (Alexander and Parsons 1973). Additional, well-controlled outcome evaluations have been performed at the Utah site. The model's effectiveness also was independently demonstrated with a between-groups design, and its impact was assessed at additional performance sites. FFT demonstrated a significant reduction in recidivism when compared with alternative treatments and no-treatment conditions. With less serious offenders, reductions ranged from 50 to 75 percent, and with very severe cases FFT was associated with a 35-percent reduction in reoffense rate. Of particular interest to the prevention field is that the offense rate of younger siblings was also significantly reduced (Klein et al. 1977). In addition to outcome evaluations, FFT focused on in-session therapist characteristics and family interaction processes, which were predictive of positive change. Most notable process changes appeared to be in family communication patterns, especially negative/blaming communication patterns (Alexander et al. 1976; Robbins et al. 1996). Process and outcome data demonstrated that therapists must be both relationally sensitive and

focused as well as capable of clear structuring to produce significantly fewer dropouts and lower recidivism.

Home-Based FFT Results

FFT was also effectively applied to serious multiple offenders using a home-based approach. Using the FFT home-based approach with serious ("hard core") delinquents who had been incarcerated for various felonies, Barton and associates (1985), found at 15-month followup a significantly lower recidivism rate (60 percent) in the FFT group compared with 93 percent recidivism at 15 months in the comparison group consisting of group home delinquents. At a 21-month followup, Gordon and colleagues (1995) likewise found a low (30 percent) recidivism rate in a group of serious multiple offenders released from State institutions compared with an expected 60 to 75 percent in a statistical comparison group. Another study of Appalachian economically disadvantaged offenders by Gordon and associates (1988) found a very low (11 percent) recidivism rate for FFT compared with 67 percent in a probation-only group.

A cost-benefit analysis (Gustafson and Cooper 1985) demonstrated that the direct costs of FFT were significantly lower than the cost of probation only. In another study, Gordon (1995) reported an even lower recidivism rate of 9 percent in a group of rural, low socioeconomic status delinquents compared with a 41 percent rate for probation only after a 60-month followup period, despite the fact that the FFT group had higher risk cases at baseline.

Hence, the FFT model targeted a wide range of adolescent behavioral problems, ranging from mild or noncriminal to severe offenses. Twenty-five years of research and evaluation of this model have demonstrated that the intervention must include a major focus on changing emotional and attributional components of family interaction.

DRUG ABUSE AND OTHER YOUTH PROBLEMS ARE PREVENTABLE

As stated by NIDA Director Dr. Alan I. Leshner, "Drug abuse is a preventable behavior, and drug dependence is a treatable disease." In addition, the prevention of drug abuse and associated youth problems are cost effective. The cost of treating a drug abuser is estimated to be about

$64,000 per year, and the cost of incarcerating and treating a delinquent juvenile is conservatively estimated at $34,000 to $64,000 per year (Camp and Camp 1990; Cohen 1994). Likewise, many drug-abusing youth become involved in delinquency, and a young adult's (ages 18 to 23) serious criminal career is estimated at $1.1 million (Cohen 1994). Substance abuse results in family disruption, lost productivity, unemployment, financial problems, accidents, crime, and legal problems (Liddle and Dakof 1995).

In contrast, Head Start intervention programs that also involve parents and teach them how to improve their parenting skills are effective in reducing predictors of substance abuse such as school academic failure for as little as $4,300 per year. Unfortunately, few prevention programs have calculated their costs and benefits, but programs have shown cost-benefit ratios in the range of 8 to 1 (Kim et al. 1995).

According to a meta-analysis of delinquency prevention programs by Lipsey (1992), a California delinquency prevention program saved law enforcement and juvenile justice systems $1.40 for every $1 spent on the program. Program evaluations of substance abuse and delinquency prevention programs highlighted in *Substance Abuse Prevention Theory and Research-Based Programs: What Works* (Kumpfer et al. 1997*b*) and *What Works: Promising Interventions in Juvenile Justice* (Office of Juvenile Justice and Delinquency Prevention 1995) suggest there are effective family programs that can reduce substance abuse as well as precursor risk factors.

As mentioned earlier in this chapter, meta-analyses of prevention efforts with drug-abusing youth suggest that the effect sizes of family interventions are greater than other prevention approaches (Andrews et al. 1990; Gendreau and Ross 1980; Gordon 1987).

A cost-benefit analysis conducted on the home-based FFT program by Gustafson and Cooper (1985) found the direct costs for FFT were significantly lower than the cost of probation only.

Effectiveness of Family Approaches

Research summarized in this monograph and by Bry (1983) on family-focused approaches indicates that family interventions are effective in reducing drug use in adolescence. The major precursors of drug use and abuse can be decreased by participation in family intervention programs.

Family-focused programs have been found to significantly reduce all the major risk domains and increase protective processes (Kumpfer 1996). High-risk families and even those with indicated "hard-core" problems in the family and adolescent can benefit from family-strengthening strategies. Despite widespread myths that high-risk families cannot be recruited for parenting or family programs, and if recruited that they will not benefit, there are tested strategies (Kumpfer 1991; Szapocznik et al. 1988) for engaging and retaining such families with positive effects. Family strengthening programs have also been found effective in reducing family risks and increasing resilience in youth to drug use in multiethnic families (Kumpfer and Alvarado 1995). There is some evidence that, by improving parenting and reducing behavioral and emotional problems in the children of substance-abusing mothers, these women can significantly decrease their own substance abuse without treatment (Kumpfer et al. 1997*a*). Hence, parenting and family programs can serve as a useful adjunct to substance abuse treatment and possibly can help reduce relapse during aftercare.

DISSEMINATION ISSUES

There are cost-effective strategies that can prevent substance abuse and delinquency by successfully reducing risk factors and strengthening protective factors in the lives of at-risk children. The problem is transferring this technology of "what works" to practitioners. Researchers from the different disciplines in universities often have little time to disseminate their findings except in research articles or book chapters read primarily by other researchers.

For this reason, a major goal of NIDA is to promote the dissemination of research-based substance abuse prevention programs to the policymakers, program planners, and implementers in the field. NIDA has conducted several technology transfer conferences on prevention and commissioned the development of a technology transfer package (National Institute on Drug Abuse, in press) that includes five monographs and the videotape Coming Together on Prevention, which is available from the National Clearinghouse for Alcohol and Drug Information. Within this package, those items of particular interest for family-based approaches are:

- *Drug Abuse Prevention: What Works* (Kumpfer et al. 1997), which provides an overview of the research on the most effective prevention programs including family-focused programs

- *Selective Prevention for Children of Substance-Abusing Parents: The Strengthening Families Program Resource Manual* (Kumpfer et al. 1997*a*), which covers family-focused programs with selective populations

Other reviews of the prevention literature that include family-focused approaches for the prevention of substance abuse and delinquency include:

- *Strengthening America's Families: Exemplary Parenting and Family Strategies for Delinquency Prevention* (Kumpfer et al., in press), which reviews model family intervention programs and is available through the University of Utah Medical Library Web site (http://www-medlib.med.utah.edu/healthed/ojjdp.htm)

- *Family-Centered Approaches To Prevent Substance Abuse Among Children and Adolescents*, Prevention Enhancement Protocols System (PEPS) (Grover 1998), which provides a literature review of family risk and protective factors, brief summaries of the major research studies on family approaches with an analysis of what works, program development and delivery issues, and emerging areas of research and practice, such as resilience- and family strength-focused programs

- *Guide for Implementing the Comprehensive Strategy for Serious, Violent, and Chronic Juvenile Offenders* (Howell 1995), which covers effective strategies for delinquency prevention, including substance abuse

CONCLUSION

To be effective, family programs must be tailored to the age, gender, and cultural needs of the children and their families (Kumpfer and Alvarado 1995). There is no one best family intervention; hence, an armamentarium of strategies for prevention is needed. Different strategies are appropriate for universal, selective, and indicated approaches to strengthening families. Dissemination of research-based models to practitioners has always been problematic. Many of the highly commercialized parenting and family programs have little research evidence of effectiveness as discovered after a thorough review of the research literature for the CSAP family-focused PEPS initiative (Grover

1998) by an expert panel cochaired by Drs. Kumpfer and Szapocznik. Clearly, more research is needed on effective models to meet diverse family needs as well as on how to disseminate these exemplary programs. NIDA has issued a special RFP for family-focused interventions for prevention of substance abuse, and more family intervention research is being funded.

While etiological research on substance abuse is making great strides in determining the most salient risk and protective factors and processes in families, equal efforts are needed to move beyond "black box," single experimental group designs to systematically explore in more depth critical component and content variables as well as different recruitment, retention, and measurement strategies in family-focused research.

The major strengths of a family-focused approach to substance abuse prevention is improving the ways that parents care for and socialize their children (Klein et al. 1977). Also, the beneficial effects in improved behaviors and social acceptance help to reduce many different problem behaviors such as dropping out of school, teenage pregnancy, delinquency, and conduct disorders (Ary et al., in press).

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AUTHORS

Karol L. Kumpfer, Ph.D.*
Director
Center for Substance Abuse Prevention
Substance Abuse and Mental Health Services Administration
Rockwall II Building, Ninth Floor
5600 Fishers Lane
Rockville, MD 20857

James F. Alexander, Ph.D.
Professor
Department of Psychology
University of Utah
1329 BEH S
Salt Lake City, UT 84112

Lynn McDonald, Ph.D.
FAST Program Founder
University of Wisconsin - Madison
Center for Educational Research
128 East Olin Avenue
Madison, WI 53713

David L. Olds, Ph.D.
Professor of Pediatrics
University of Colorado Health Sciences Center
Director
Prevention Research Center for Family and Child Health
303 East 17th Avenue, Suite 200
Denver, CO 80203

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*When this meeting was held, Dr. Kumpfer was Associate Professor in Health Education, Department of Education, University of Utah, Salt Lake City, UT.

Scientific Findings From Family Prevention Intervention Research

Brenna H. Bry, Richard F. Catalano, Karol L. Kumpfer, John E. Lochman, and José Szapocznik

The critical role of family factors is acknowledged in virtually every psychological theory of substance abuse (Brook et al. 1990; Bry 1983; Catalano and Hawkins 1996; Dembo et al. 1979; Dishion et al. 1988; Elliott et al. 1989; Hawkins et al. 1992; Jessor 1993; Kandel and Davies 1992; Kaplan and Johnson 1992; Kellam et al. 1983; Kumpfer 1987; Newcomb and Bentler 1989; Oetting and Lynch 1993; Wills et al. 1992). Nevertheless, only recently have research findings about family protective and risk factors been applied in prevention intervention research. After briefly reviewing family factors that have been found to affect the probability of adolescent substance abuse, this chapter describes some ongoing prevention intervention research designed to alter family functioning in order to reduce adolescent substance abuse.

Participants in both the family factors studies and the prevention intervention studies come from a wide range of racial, ethnic, socioeconomic, and cultural backgrounds, so the findings have broad generalizability. Questions that have been addressed so far in family-based prevention intervention research are: Does targeting family functioning increase prevention effects compared with targeting solely youths' substance abuse precursors? How can intervention programs recruit families? Are fathers affected by interventions differently than mothers? How can risky parenting practices be altered through prevention interventions, both in the short and the long runs? What youth substance abuse precursors can be changed through family interventions? When and how do these changes occur over time? The chapter concludes with questions that still need to be addressed. As is typical in the scientific process, the recent studies raise new questions as they answer others.

PROTECTIVE AND RISK FAMILY FACTORS

Protective Family Factors

Family factors that appear to inhibit substance abuse can be categorized into five broad characteristics or activities that take place both in the home and outside the home. Protective factors within the home include close, mutually reinforcing parent-child relationships (Brook 1993; Brook et al. 1984, 1990; Catalano et al. 1993; Dishion et al. 1988; Werner and Smith 1992). Positive discipline methods on the part of parents are also protective against substance abuse (Block et al. 1988; Catalano et al. 1993; Dishion et al. 1988; Kellam et al. 1983). Protective factors outside the home include monitoring and supervision of children's activities and relationships (Catalano et al. 1992; Chilcoat et al. 1995; Dishion et al. 1988; Ensminger 1990; Fletcher et al. 1995; Richardson et al. 1989; Smart and Gray 1979). Family involvement with and advocacy for the children outside of the home, such as at church and in school, also prove to be protective against substance abuse (Brunswick et al. 1992; Kandel and Davies 1992; Krohn and Thornberry 1993). Finally, parents' taking initiative and seeking information and support for the benefit of their children is protective (Crockenberg 1981; Nye et al. 1995; Rhodes et al. 1992, 1994; Stack 1974). These protective factors appear to reduce adolescent substance abuse by establishing a parent-child relationship, from birth, within which parents exert strong positive influence by knowing what their children do day to day, by providing ample praise for their appropriate behaviors, and by constantly introducing them to and actively supporting their engagement in a variety of pleasurable alternatives to substance abuse.

Family Risk Factors

On the other hand, there are other family factors that clearly increase the probability that a child will abuse substances. Parental rejection and neglect heighten the risk of substance abuse (Block et al. 1988; Shedler and Block 1990). Physical abuse, sexual victimization, and other exposure to violence greatly increase the probability of substance abuse (Briere 1988; Briere and Zaidi 1989; Burnam et al. 1988; Clayton 1992; Dembo et al. 1989, 1992; Miller et al. 1987; Polusny and Follette 1995; Rohsenow et al. 1988; Zierler et al. 1991). Finally, substance abuse by parents and siblings greatly increases the chance that children will abuse substances (Andrews et al. 1993; Brook et al. 1991; Dishion et al. 1988; Merikangas et al. 1992; Sher et al. 1991). In sum, these family risk

factors seem to increase substance abuse by producing children with memories of rejection, pain, humiliation, and interpersonal conflict, while depriving them of the protective factors of interpersonal warmth, supervision, and positive guidance in effective life functioning. The unpleasantness in these children's lives increases the reinforcing value of substance use, while the missing protective factors leave the children without viable, alternative methods to gain pleasure or relief from pain.

CHANGING FAMILY FUNCTIONING TO PREVENT SUBSTANCE ABUSE

An obvious implication of the above review of protective and risk family factors is that perhaps substance abuse could be prevented if family functioning could be changed. The studies that are reviewed below have begun investigating this hypothesis, one question at a time. Their findings are promising enough to warrant further research into improving family factors.

Does Targeting Family Functioning Increase Prevention Intervention Effects Compared With Targeting Individual Youth Precursors to Substance Abuse?

In a randomized clinical trial, Szapocznik and associates (Santisteban et al., in preparation) at the Miami Spanish Family Guidance Center compared the effects of brief strategic/structural family therapy (Szapocznik and Kurtines 1989) with an adolescent group therapy format control condition in a sample of Hispanic families with adolescents (ages 12 to 17) who were either using drugs or at risk for drug use due to behavior problems, which are precursors to substance abuse. In addition to the comparison of intervention effectiveness, this study also investigated the hypothesized mediating relationship of changes in family interaction on the global efficacy of the intervention.

In this study, a group format for the control condition was selected because it is a modality widely utilized with behavior problem adolescents and does not have family functioning as its hypothesized mechanism of change. This condition involved a process-oriented intervention in which group members were encouraged to discuss and solve problems among themselves. It is important to note that this study did not attempt to test group therapy interventions that were state of the art, but rather was designed to provide a control for the essential

nonspecific ingredients critical to the therapy process. Because the family and group interventions shared certain characteristics but were sufficiently distinct from one another, the group condition served as an excellent choice for a comparison group. For example, both family and group interventions focused explicitly on the overt interactions of session participants in the here and now; in the family condition, however, the focus of intervention was on family interactions, while in the group condition, the focus was on interactions in the peer group context.

This study used a mixed experimental design. The between-groups factor was the two levels of intervention (structural family therapy and group therapy), and the within-groups factor was time, using a repeated measures approach with two assessment points (pretherapy and posttherapy). An experimental design was achieved by randomly assigning 79 adolescents to one of two conditions: (1) brief strategic/structural family therapy or (2) control group therapy condition (Santisteban et al., in preparation).

Results

Subjects assigned to the family intervention condition showed significantly greater improvement in behavior problems than did subjects assigned to the control condition ($p < 0.05$). Family therapy cases showed significant preintervention-to-postintervention improvement in both conduct disorder ($p < 0.001$) and socialized aggression ($p < 0.001$), while control condition cases showed no significant change in either conduct disorders or socialized aggression. Analyses of clinical significance revealed similar findings.

A set of exploratory analyses was used to examine the impact of treatment on the proposed mediating variable, family functioning as measured by the Structural Family Systems Ratings (Hervis et al. 1991; Szapocznik et al. 1991). This measurement involved the administration of standardized stimuli composed of three tasks that the family must perform together. The scoring of family functioning was organized into broad, theoretically and clinically important dimensions of structural (i.e., interactional) family functioning, boundaries and emotional distance between family members, and conflict resolution, a measure of the family's ability to express, confront, and negotiate differences of opinion, disagreements, and conflicts. The researchers partitioned the 49 cases that finished the study into two groups based on a median split: "good family functioning" at intake (N = 27) and "poor family

functioning" at intake (N = 22). Results indicate that in the "poor family functioning" group, cases in the family condition showed significant pretherapy-to-posttherapy improvement; while in the control condition, no significant change was observed. On the other hand, the "good family functioning" group, cases in the family condition showed no significant change in family functioning, while cases in the control condition showed statistically significant deterioration.

Thus, this comparison study addressed two important questions about the feasibility of applying knowledge about family risk and protective factors to the prevention of adolescent substance abuse. First, the results support the notion that poor family functioning can be improved if prevention interventions are designed to do so. Second, the study shows that targeting family functioning can reduce adolescent substance abuse precursors (i.e., behavior problems). Encouraging results such as these, however, raise another question: How can parents whose families are not functioning well be persuaded to take advantage of family prevention interventions?

How Can Hard-To-Reach Families Be Engaged in Family Interventions?

Engaging families of conduct-disordered adolescents is a challenge to the field. To bring these families into intervention, Szapocznik and associates developed and tested Strategic Structural Systems Engagement (Szapocznik and Kurtines 1989; Szapocznik et al. 1990). This model is based on the premise that resistance can be redefined as a "symptom" that is maintained by a family's patterns of interactions. Thus, within their framework, the solution to overcoming the undesirable symptom of resistance is to restructure that family's patterns of interactions that permit the symptom of resistance to continue to exist. After this first phase of the intervention process is accomplished in which resistance has been overcome and the family is participating, the adolescents' problem behaviors can then be treated through family therapy.

To test the effectiveness of Strategic Structural Systems Engagement in engaging and bringing to therapy completion families with drug-using youth, a major experimental study was conducted (Szapocznik et al. 1988). An experimental design was achieved by randomly assigning 108 Hispanic families of drug-using adolescents with problem behaviors to one of two conditions: Strategic Structural Systems Engagement or

Engagement as Usual. The Engagement as Usual condition was the control condition. In the control condition, the clients were approached in a way that resembled as closely as possible the kind of engagement that usually takes place in outpatient centers. The Engagement as Usual condition was defined through a survey of a representative sample of local outpatient treatment centers.

Considerable work was done in developing a manual for the experimental condition (Szapocznik and Kurtines 1989; Szapocznik et al. 1990) and in describing modality guidelines for both conditions to ensure the standardization and replicability of the study. Treatment integrity guidelines and checklists were developed for both conditions. Treatment integrity analyses demonstrated that interventions in both conditions adhered to guidelines and that the two modalities were clearly distinguishable by the level of engagement effort applied ($F[1,106] = 106.69$, $p < 0.001$). The family intervention itself, however, was identical for the two engagement groups.

Results

The effects of the experimental condition were dramatic. Over 57 percent of the families in the Engagement as Usual condition failed to be engaged into treatment compared with 7.15 percent (four families) in the Strategic Structural Systems Engagement condition ($p < 0.001$). The differences in retention rates were also dramatic. In the Engagement as Usual condition, dropouts represented 41 percent of the cases that were engaged, whereas dropouts in the Strategic Structural Systems Engagement condition represented 17 percent of the engaged cases. Thus, of all of the cases that were initially assigned, 25 percent in the Engagement as Usual condition and 77 percent in the Strategic Structural Systems Engagement condition were successfully terminated ($p < 0.001$). For families that completed treatment in both conditions, there were highly significant improvements both in overall problematic adolescent functioning ($F[1,57] = 39.83$, $p < 0.0001$) and in adolescent drug use ($[1,N = 56] = 40.00$, $p < 0.0001$); these improvements were not significantly different across the engagement conditions. The critical distinction between the conditions was their differential rates of engagement and retention.

A second study, designed to replicate these findings and to further explore the mechanism by which the interventions' efficacy was achieved, has replicated the original findings and supports the notions

that specialized interventions can dramatically increase rates of engagement of hard-to-reach families (Santisteban et al. 1996). Thus, research by Szapocznik and associates clearly shows that not only can family prevention intervention reduce precursors to substance abuse, but also hard-to-reach families can be recruited to take advantage of this effective intervention. Such promising results raise another question, described in the next section.

How Are Fathers and Mothers Affected by Family Prevention Interventions on a Session-by-Session Basis?

Based on promising program results of the Strengthening Families Program (SFP) (Kumpfer 1981; Kumpfer et al. 1989) in several independent replications, a group of researchers at the Center for Family Research in Rural Mental Health at Iowa State University selected SFP for a National Institute of Mental Health-funded clinical research trial targeting all middle school-age youth and their families in economically disadvantaged counties in rural Iowa.

As covered by Kumpfer (this volume), SFP has repeatedly been found in experimental and quasi-experimental studies to improve family relations, parenting, and children's negative behavior and social skills as well as reduce parent's and older children's drug use. These results are for prior National Institute on Drug Abuse (NIDA) and Center for Substance Abuse Prevention (CSAP) studies in Salt Lake City, UT; Selma, AL; and Detroit, MI. (For overviews see Kumpfer et al. 1996.)

The content of the program was modified to be age appropriate and to match local culture. Additionally, the content of the program was based on resiliency-enhancing principles derived from developmental psychopathology research and Kumpfer's Resilience Framework (Kumpfer 1994, in press-*a, b*; Kumpfer and Bluth, in press). The new program, called the Iowa Strengthening Families Program (ISFP), was developed by Drs. Kumpfer and Molgaard (Molgaard and Kumpfer 1993). They provided 3 days of extensive training to 65 carefully selected adults who, in teams of three (two in the youth skills training group and one in the video-based parent training group), delivered the family skills training program in experimental schools.

The content of the youth sessions focused on strengthening prosocial dreams and goals for the future, dealing with stress and strong emotions, appreciating parents and elders, increasing the desire to be responsible,

and building skills to deal with peer pressure. Parent sessions included discussions of parents' potential positive influence on preteens and young teens, understanding the developmental characteristics of youth this age, providing nurturing support, dealing effectively with children in everyday interactions, setting appropriate limits, following through with reasonable and respectful consequences, and sharing beliefs and expectations regarding alcohol and other drug use. During the family sessions, parents and youth practiced listening and communicating with respect, identifying family strengths and family values, using family meetings to teach responsibility and solve problems, and planning fun family activities. Youth, parent, and family sessions made use of discussions, skills-building activities, viewing videotapes that model positive behavior, and games designed to strengthen positive interactions between family members.

Because recruitment of families for parenting and family programs can be difficult if not carefully planned, when engagement of families was not considered a major part of the program activities (Kumpfer 1991; Spoth and Redmond 1993; Szapocznik et al. 1988), SFP followed recruitment procedures developed after extensive experience in recruiting local families for studies at the Center for Family Research in Rural Mental Health at Iowa State University (also see Spoth and Redmond 1996). After receiving a letter of endorsement from their school principal, program flyers, and announcements in the school, each eligible family was sent an introductory letter followed by a phone call inviting them to participate in the research project. Families with sixth graders, including those who did not volunteer for the research and did not complete the pretest, were invited to attend the ISFP held in the local school. All families were called by a local parent to encourage their involvement. Parents and youth were also encouraged to participate by advertising incentives that included free $5 grocery certificates for parents, given at two of the sessions, and coupons for free video rentals and food for the youth. In addition, the youth were told that they would receive a "graduation" gift of $25 if they and their parent(s) attended at least five of the first six sessions.

To evaluate program impact, a large-scale clinical trial, including long-term followup evaluations (1- and 2-year followups in addition to pretests and posttests), was undertaken in 19 counties in rural Iowa. To avoid contamination problems resulting from the frequent interaction of families in small rural communities, schools were the unit of assignment selected on the basis of high percentages of low-income families

participating in a school lunch program. The true experimental design included random assignment of 33 schools to three conditions: (1) ISFP (Molgaard and Kumpfer 1993); (2) Preparing for the Drug-Free Years (Hawkins et al. 1992), a five-session youth and family program; and (3) a minimal contact control condition. Families in the minimal contact control condition received four Cooperative Extension Service leaflets, which gave information on developmental changes of preteens and teens in physical, emotional, cognitive, and relational domains.

This chapter, however, reports only the results of session-by-session surveys administered to the mothers and fathers who attended ISFP sessions. These surveys were collected at the beginning and end of each session on content specific to the topics of the seven sessions and analyzed by Kumpfer at the University of Utah. The reason to collect these data was to determine the immediate impact on the family members of the skills training and to compare their intentions to change with actual reported behavior.

Participants were from a total of 161 families recruited into 21 ISFP groups at 11 different schools. The groups ranged from 3 to 15 families with an average group size of 8 families, composed of an average of 12 adults and 8 youth. Both single-parent and two-parent families participated. In more than half of the two-parent families, both parents attended at least some of the sessions. Eighty-five percent of the families completed five of the first six sessions. Of the parents who attended one of the sessions, 38 percent were fathers and 62 percent were mothers.

Results

At the University of Utah, standard statistical tests were used to assess changes in parents' endorsements of targeted attitudes and behaviors from the beginning of a training session to the end of the same training session. Mothers' data were analyzed separately from fathers' data. Presession-to-postsession, self-reported, statistically significant improvement was found in many of the targeted attitudes about parenting and actual parenting behaviors. Examples are: Only fathers reported increased commitment to support youth's dreams and goals ($p = 0.01$) and increased willingness not to lose tempers when talking to their child ($p = 0.002$); only mothers reported increased knowledge of importance of letting children learn from their own experiences ($p = 0.000$) and increased importance placed on the value of family meetings ($p = 0.000$);

both fathers and mothers increased awareness of the value of setting rules ($p = 0.02$ and $p = 0.015$, respectively) and increased willingness to be involved in school and child's schoolwork ($p = 0.01$ and $p = 0.004$, respectively). It is noteworthy that improvement occurred in a greater percentage of session objectives in the later sessions (4 through 6) than in the earlier sessions (1 through 3). Another observation is that improvement in fathers was often different from the improvement in mothers.

Correlational tests were used to compare parents' behavioral intentions at the end of one training session with their actual reported behavior at the beginning of a subsequent session. Again, the areas where there were statistically significant relationships between intentions and subsequent reported behavior were generally different for mothers and fathers. For example, mothers alone reported significant correlations between intentions and subsequent behavior in "discussing your sixth grader's goals and dreams" ($r [121] = 0.346$, $p < 0.000$); in "sitting down as a family to discuss concerns, schedules, rules, or plans for a family activity" ($r [120] = 0.341$, $p < 0.000$); and in "thinking of consequences that are related to your child's misbehavior and are not too harsh" ($r [121] = 0.228$, $p < 0.01$). On the other hand, fathers alone reported significant correlations between intentions and subsequent behavior in "complimenting, praising, or encouraging your child" ($r [52] = 0.267$, $p < 0.05$) and in "listening carefully to your child's point of view when there is a problem" ($r [42] = 0.387$, $p < 0.01$). There were only two areas in which both fathers and mothers showed significant correlations between intentions and subsequent behavior. These areas were "thinking about what might have triggered anger or another strong emotion in their child" ($r [53] = 0.393$, $p < 0.004$ and $r [113] = 0.208$, $p < 0.027$) and "discussing rules and consequences concerning alcohol, tobacco, and drugs with their preteen" ($r [53] = 0.309$, $p < 0.02$ and $r [119] = 0.260$, $p < 0.004$, respectively).

Taken together, these session-to-session findings support the hypothesis that intention to change is often a precursor of behavioral change, but not always, and that parenting practices can be affected positively, at least in the short run, through prevention intervention. The longer term posttest and annual followup data will be compared with the short-term results to create a more complete picture of changes in the families. The findings also suggest that the greatest impact comes after several training sessions (i.e., just two or three sessions are not sufficient). The results also suggest that maximum benefits occur only if both fathers and mothers

attend, in that fathers and mothers were generally affected by the training in different ways. A question that these promising improvements in protective family factors raise, however, is whether family prevention intervention might also reduce family-related risk factors, such as parental substance abuse.

Can Risky Parenting Practices Be Affected by Family Prevention Intervention?

The Focus on Families (FOF) was designed by Catalano and associates as a multipronged intervention for families headed by recipients of methadone treatment (see Catalano et al., in press-*a*, *b*; Gainey et al. 1995; Hoppe et al., under review; Plotnick et al., in press). FOF was meant to address both family-related risk factors for children's substance abuse and risk factors for parents' relapse. The intervention was also designed to enhance family-related protective factors. A primary goal of the intervention was to reduce parents' illicit drug use by teaching them relapse prevention and coping skills. Parents were also taught how to manage their families better by increasing child involvement in problemsolving, providing opportunities for involvement, giving consistent consequences for both positive and negative behavior, setting clear expectations for their children, and addressing conflict. Although a number of programs have been developed to reduce children's risk of drug abuse when one or both parents have a substance abuse problem (Falco 1992; Gross and McCaul 1992; Haskett et al. 1992; Russel and Free 1991; Springer et al. 1992), few rigorous experimental evaluations of these programs have been published (Catalano et al., in press-*c*; Kumpfer and DeMarsh 1986). Thus, FOF represents one of the first randomized experimental evaluations of a prevention intervention with this population.

There were 144 parents from 130 families recruited from two Seattle-area methadone clinics during the course of 2½ years. To be eligible to participate, parents had to have been in methadone treatment for a minimum of 90 days and have one or more children between the ages of 3 and 14 years. Seventy-five percent of the parents in the sample were female, 77 percent were white, 18 percent were African American, and 5 percent were of mixed or other ethnicity. Parents' mean age was 35.36 (SD = 5.67), and their mean age of first use of opiates was 19.14 (SD = 5.00). Families were randomly assigned to either the experimental or the control condition after blocking on parents' race, parents' age at first drug use, whether parents lived with a spouse or

partner, and ages of children. Because of anticipated attrition from the experimental program, a higher proportion of eligible families were assigned to the experimental (N = 75) than to the control (N = 55) condition. Of the 144 parents and 178 children who enrolled in the project, 94 percent were interviewed immediately after the completion of the parenting training groups portion of the intervention, 94 percent were interviewed 6 months later, and 92 percent completed a 12-month followup interview. (Children younger than 6 years were not interviewed.) Attrition did not vary by condition at any of the timepoints. A descriptive comparison of initial behavior problems of the FOF children with those of other urban school children in high-crime neighborhoods in the same city showed a significantly higher prevalence of cigarette and marijuana use, school suspension or expulsion, and having been picked up by the police (all $p < 0.05$) among the FOF sample.

FOF is of long duration, pays particular attention to recruitment and retention mechanisms, and offers other supportive services. The FOF intervention lasts 9 months (a 5-hour family retreat, 4 months of 32 twice-a-week parent training groups, 9 months of home-based services). Children attend 12 sessions to practice skills with parents. The program is linked with other treatment services (housing, child welfare services, employment services, etc.), when appropriate.

The FOF parent training session topics focus on specific developmental risk and protective factors and include the following: family goal setting, relapse prevention, family communication skills, family management skills, creating family expectations about other drugs and alcohol, teaching skills to children, and helping children succeed in school. In addition to the parenting curriculum, the program also includes home-based case management to help parents and children generalize and maintain the skills learned in group sessions. These home-based services are provided to families for about 9 months, beginning 1 month before the start of the parent training sessions and continuing through the group training period (4 months) and 4 months afterward.

Results

Seventy-five percent of eligible parents consented to be involved in the study. Of those assigned to the program condition (N = 82), 86.5 percent (71) initiated participation in the parenting groups. These relatively high

rates of consent and initiation for this high-risk sample suggest that parents in treatment for opiate addiction are willing to enroll in an intensive family prevention program.

Treatment exposure measures were rated at the end of each skill session by parent skill group leaders. There was tremendous variation in participation in the skills training sessions. Clients attended about half of the sessions and actively participated in about 40 percent of the sessions they attended.

Outcomes of the FOF program for both parents and children were measured at immediate postparent training and the 6- and 12-month followups. All statistically significant differences between the experimental and control parents favored the experimental group. Experimental parents reported greater relapse prevention self-efficacy and skill at immediate posttest and at 12-month test followup. At the 12-month followup, experimental families also reported less domestic conflict and had established more household rules than control families. Importantly, experimental parents reported using significantly less heroin at the end of parent training and at the 12-month followup than control parents. Biochemical measures to assess veracity of self-reports of drug use were employed with a random sample of subjects at each time period, and no experimental-control difference in veracity was discovered.

Few experimental-control differences were found in child outcomes. Interestingly, two differences appeared to favor the control group. At the 6-month followup, control children were more likely to report that their parents used denying privileges as a form of discipline. At 12 months, experimental children were less likely to be living with their FOF parents.

Other statistically significant differences, however, showed age group interactions. Whereas no effect was found for younger children at the 6-month followup, older experimental children were less likely than older control children to be living with their father. Also at 6-month followup, the youngest experimental children reported significantly more involvement in activities with their parents than the youngest control children, while the effect was the opposite for the older experimental children, who reported engaging in fewer activities with their parents than did the older controls.

The FOF project has documented several key findings. First, children of recipients of methadone treatment displayed higher levels of problem behavior than similar-age children in a general population sample. Second, parents in methadone treatment can be successfully engaged and will participate in intensive family interventions, as indicated by the high level of consent to participate and the substantial percentage of parent training sessions experimental parents attended. Third, the risk- and protective-focused intervention increased parent relapse prevention skills and self-efficacy. Fourth, the intervention had important effects on reducing parents' drug use and domestic conflict and increasing the number of family rules. Fifth, the intervention had few impacts on children's reports of risk factors. There were indications, however, that the intervention increased involvement in prosocial activities for young children, but decreased such involvement for older children.

Overall, this pattern of results is promising both as a treatment adjunct to reduce parental drug use and as a risk reduction approach to prevent substance abuse among children. For parents in methadone treatment, these results show dramatic reductions in frequency of use of heroin, the primary drug of abuse. These are effects above those produced by involvement in a methadone treatment program. Programs like FOF may be an important adjunct to treatment programs to aid in reducing participants' drug use.

As a prevention intervention for children of substance abusers, there is also promise of effectiveness. Reductions in family risk factors—including parents' self-efficacy and skill levels, family management, domestic conflict, and parents' drug use—were strongest at 12-month followup. Theoretically, changes in parent behavior are expected prior to changes in child behavior, and changes in parent behavior are expected to precede changes in children's perceptions of parent behavior. Furthermore, child reports of differences favoring the control group at the 6-month followup disappeared at the 12-month followup. Consequently, Catalano's preliminary results leave as yet unanswered (1) exactly what effects a family intervention might have on children's substance abuse precursors and at what point in the child's life might a family intervention have an effect and (2) whether delayed or "sleeper" effects might appear after a family intervention is completed.

What Specific Youth Substance Abuse Precursors Can Be Reduced Through Family Intervention, and When Developmentally Can These Changes Occur?

In preliminary analyses of the first cohort in the Coping Power Program (CPP), Lochman and Wells (1996) have found indications of effects on two youth substance abuse precursors as well as indications for timing interventions at important developmental transition points. In the first cohort for CPP, 120 boys identified as being at risk for substance abuse because of high levels of teacher-rated aggression in fourth or fifth grades were randomly assigned to three cells. The first two cells consisted of a school-based child intervention and of a combined child plus parent intervention, and the third cell was an untreated risk cell. The child component focused on the social-cognitive difficulties of aggressive children and was based on an anger coping program that has provided substance use prevention effects at a 3-year followup in adolescence (Lochman 1992). The child component was provided in a group format in boys' elementary and middle schools and lasted for 33 sessions across 1¼ years. The parent component was provided in a group format offered in community and school settings and had 16 sessions over the 1¼-year intervention period. The parent intervention addressed alternative, less harsh methods of discipline, increased monitoring, and stress management for the parents. Within the authors' conceptual model, a key mediator for children's aggressive behavior, as a proximal outcome, and for early substance use, as a distal outcome, is children's social competence. Examining teachers' ratings of social competence (assessing children's regulation of emotional arousal, negotiation skills, and problemsolving), Lochman found that the two intervention cells had significantly higher levels of social competence at the end of the intervention period than did the untreated aggressive boys' cell. Notably, the combined intervention produced the highest levels of social competence, indicating potential synergistic effects of the parent and child interventions combined. Thus, parent intervention appears to promote parents' facilitation of children's socially competent behavior with their peers and teachers.

When parents' ratings of children's aggressive behavior were examined for the first cohort, Lochman found that the two intervention cells produced significant reduction in boys' aggressive behavior, in comparison with the untreated aggressive cell, primarily for the boys identified in fifth grade. Thus, intervention appeared to have more notable effects on boys' aggressive behavior at home when it began in

the year prior to the middle-school transition and then continued throughout the first middle-school year (fifth- and sixth-grade intervention period) than when intervention occurred only prior to the middle-school transition (fourth- and fifth-grade intervention period). This preliminary finding suggests that these prevention interventions may have maximal effect when provided at developmental transition points when children and parents are concerned about upcoming changes and are relatively open to intervention.

Can Delayed or "Sleeper" Effects on Youth Substance Abuse Precursors Appear After a Family Intervention Is Completed?

Bry and associates (1986), Bry and Krinsley (1992), and Krinsley (1991) have repeatedly found evidence of delayed or "sleeper" effects on youth substance abuse precursors as a result of the researchers' prevention intervention, which combines home-based, family behavioral counseling and school-based, youth behavioral counseling. A therapist meets weekly both individually with an "at risk" youth at the middle school and together with the youth and his or her parents at home. At the meetings, the therapist reviews what one of the youth's teachers says that the youth can do specifically that week to improve his or her grades or behavior (e.g., hand in 25 completed math problems or arrive at class on time). Then the therapist helps the youth plan how to accomplish the goal and models and coaches the parents to facilitate and recognize the accomplishment. As a function of the current collaboration between project directors Bry and associates (1991) and Boyd-Franklin (1989), the prevention intervention is now known as Targeted Adolescent/Family Multisystems Intervention (TAFMI). The youth substance abuse precursors that this family prevention intervention reliably reduces are (1) poor middle-school performance; (2) early adolescent substance use, if use has already commenced; and (3) the initiation of substance use, if use has not already commenced.

In the most recently completed study, Krinsley (1991) guided the school personnel in an ethnically mixed (black, white, and Hispanic) working-class, northeastern town to identify the seventh and eighth graders with the highest numbers of substance abuse precursors. After the researchers received consent from 88 percent of the parents, who were told that their adolescents were identified because they could do better in school, the youth all received a year of school-based monitoring and behavioral and academic counseling plus booster sessions. A randomly determined half of the families also received 3 to 4 months of coordinated, home-based,

behavioral family counseling plus booster sessions (TAFMI), which aided parents in monitoring and supporting their adolescents' school performance and appropriate behavior at school and in the community. The sessions were scheduled at the family's convenience and rescheduled repeatedly until they actually occurred. In response to this respectfully persistent approach, 100 percent of the families assigned to the combined youth and family counseling condition completed the intervention.

No group difference in school performance or substance use was observed during the academic year when the active interventions occurred. During the followup year, however, the grade point average of the adolescents who had received only the school-based counseling began to decrease over time until it had decreased from 70 to 67. Because the grade point average of the adolescents who had received both the school- and family-based counseling simultaneously increased over time from 70 to 75, by the end of the followup year the school performances of the two experimental groups were on entirely divergent trajectories and were statistically significantly different. Even more importantly, the substance use patterns of the two groups were also on divergent trajectories and were statistically significantly different by the end of the followup period. Whereas the group of adolescents who received only the school-based counseling increased their substance use during the 2 academic years of the study, individual analyses revealed that not one of the adolescents who received both school-based and family-based counseling increased substance use or initiated substance use during the 2 academic years of the study.

Thus Krinsley's (1991) results suggest, as do others', that family prevention interventions can indeed generate positive effects on youth substance abuse precursors that do not appear immediately at the end of the interventions. Krinsley's substance use findings also illustrate that positive effects can occur in the form of merely maintaining preintervention levels, in that the natural lifecourse for many high-risk youth is deterioration over time. The booster sessions probably helped Krinsley's intervention effects increase over time. Given Krinsley's experimental design, however, the most likely determinants of the delayed, or sleeper, intervention effects were increased influence and involvement of the youth's family members.

CONCLUSIONS

Taken together, the above preliminary family prevention intervention studies, from a variety of communities and perspectives, suggest that (1) family functioning and parenting behavior can be altered preventively by explicitly including families in the intervention; (2) hard-to-reach families can be recruited to participate by employing specific engagement techniques; (3) fathers and mothers should both be included in the intervention because they can be affected differently by it on a session-by-session basis; (4) a youth's substance abuse precursors can be reduced over time by family prevention intervention; and (5) risky parenting behaviors, such as substance abuse, can also be reduced by family prevention intervention. This promising evidence that family prevention interventions can affect family functioning and youth precursors, however, raises further questions. For instance, How broadly generalizable are these preliminary findings—across cultures, races, ethnicities, and socioeconomic groups? Furthermore, most of the interventions have been aimed at one specific age group; yet some children's lives have substance abuse risk factors from birth. Is there an optimum age for family prevention interventions, or is it necessary for some youth's families to experience interventions at several different developmental transitions? Moreover, Do interventions have optimal lengths, or should length be individualized, based on the measurement of risk or protective factors?

At least two of the above studies raise the issue of unintended effects. Santisteban and colleagues (in preparation) reported that a youth group intervention showed evidence of harming some families' functioning. Catalano observed that FOF may lead to older children's spending less time with their parents. Future studies could assess whether such unintended effects are replicable and whether they contribute negatively or positively to youth outcomes. Minimally, their findings should alert researchers to measure more outcomes and to watch for possible unintended intervention effects.

Finally, the studies introduce intriguing questions about the change processes involved. What changes in family members and their adolescents persist beyond family sessions as a function of intervention? How do these changes interact with risk and protective factors? Eventually, researchers can explore exactly what mechanisms, processes, and mediating variables link family intervention effects with what youth actually do when they have an opportunity to use or refuse substances.

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ACKNOWLEDGMENTS

This chapter was prepared with support from National Institute on Drug Abuse grant no. R01 DA05824-02. Kevin P. Haggerty, Charles Fleming, Devon Brewer, and Randy Gainey participated in conducting, analyzing the data for, and reporting on the FOF research.

AUTHORS

Brenna H. Bry, Ph.D.
Professor
Graduate School of Applied and Professional Psychology
Rutgers University
Box 819
Piscataway, NJ 08855-0819

Richard F. Catalano, Ph.D.
Associate Director and Professor
Social Development Research Group
University of Washington
146 North Canal Street, Suite 211
Seattle, WA 98103

Karol L. Kumpfer, Ph.D.*
Director
Center for Substance Abuse Prevention
Substance Abuse and Mental Health Services Administration
Rockwall II Building, Ninth Floor
5600 Fishers Lane
Rockville, MD 20857

John E. Lochman, Ph.D.
Associate Professor of Psychiatry
Duke University Medical Center
Building E, Room 106
2214 Elder Street
Durham, NC 27710

José Szapocznik, Ph.D.
Professor and Director
Center for Family Studies
Department of Psychiatry and Behavioral Sciences
University of Miami
Third Floor
1425 NW 10th Avenue
Miami, FL 33136

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*When this meeting was held, Dr. Kumpfer was Associate Professor in Health Education, Department of Education, University of Utah, Salt Lake City, UT.

A Universal Intervention for the Prevention of Substance Abuse: Preparing for the Drug-Free Years

Richard F. Catalano, Rick Kosterman, Kevin Haggerty, J. David Hawkins, and Richard L. Spoth

Until relatively recently, one of the major impediments to effective preventive interventions was the absence of a framework for empirically based prevention. Prevention efforts often failed because they were based on models of adolescent problem behaviors, including substance abuse, which were inconsistent with the empirical evidence. However, tremendous strides have been made in identifying some of the potential causes of adolescent problem behaviors. Factors that are longitudinally related to drug use or abstention have been articulated in typologies of risk and protective factors (e.g., Hawkins et al. 1992, 1995; Institute of Medicine 1994; Loeber et al. 1991; Newcomb and Felix-Ortiz 1992; Newcomb et al. 1987; Werner and Smith 1992). The number of epidemiological and etiological studies providing the basis for these typologies has helped to usher in a new era of risk- and protective-focused prevention. Interventions at any level, from individual through community, can now be carefully designed to address known predictors of substance use identified in the empirical literature.

Despite this progress, there often remains a perception that prevention of drug use lacks an explicit framework for effectiveness rooted in the rigors of science. It is important to reiterate that this is no longer the case. As evidenced by recent reports from the Institute of Medicine (1994) and others (e.g., Coie et al. 1993; Kellam and Rebok 1992), the science of prevention has matured. A new paradigm has emerged whose practicality is demonstrated in the success of risk- and protective-focused prevention interventions.

UNIVERSAL PREVENTION PROGRAMS

A fundamental issue in prevention design is determining the appropriate target for an intervention. Given limited resources, how narrowly or broadly should a particular program be disseminated? Specifically, for whom would a particular intervention to reduce risks and enhance

protective factors be most worthwhile? The Institute of Medicine (1994) addressed this question and developed a classification system for the dissemination of intervention programs (see also Gordon 1983). In this system, prevention was divided into universal, selective, and indicated interventions, from the most broad to the most narrow target populations, respectively. It was proposed that the appropriateness of an intervention depends on the prevalence of the problem being addressed, the acceptability and safety of the program, and the cost of the program. Given the high prevalence of substance use among America's young people (Johnston et al. 1995), universal interventions that can be implemented with widespread acceptability and efficiency are often desirable.

The Institute of Medicine (1994) defined universal prevention interventions as those "targeted to the general public or a whole population group that has not been identified on the basis of individual risk; the intervention is desirable for everyone in that group" (p. 24). For example, programs that benefit the general public or specific subpopulations not identified on the basis of risk, such as a city's or a neighborhood's residents, women, children, or elderly persons, are universal. Benefits outweigh costs in effective universal programming. Immunizations, prenatal care, use of seatbelts, and prevention of smoking are all examples of universal interventions. A universal intervention for the prevention of substance abuse, Preparing for the Drug-Free Years (PDFY), is the focus of this chapter.

Theoretically and empirically driven risk reduction and protective factor enhancement is a promising universal strategy for the prevention of health and behavior problems among adolescents (Coie et al. 1993; Hawkins et al. 1992; Institute of Medicine 1994). In order to be successful, risk- and protective-focused prevention strategies must seek to ameliorate those factors that have been shown in longitudinal studies to be predictive of targeted health and behavior problems.

A number of factors have been identified in family interactions that contribute to risk and protection in the development of childhood substance use and problem behaviors. Children in families that provide little parental supervision and monitoring, a low degree of communication and interaction between parents and children, poorly defined and poorly communicated rules and expectations for children's behavior, and inconsistent and excessively severe discipline are at increased risk for conduct disorder, delinquent behavior, and substance abuse (Hawkins et

al. 1992; Kandel and Andrews 1987; Patterson and Dishion 1985). Other family risk factors for substance abuse include family conflict (Brook et al. 1990; Farrington et al. 1985), favorable parental attitudes toward teen alcohol and other drug use (McDermott 1984), favorable sibling attitude toward use (Brook et al. 1988), and parental alcoholism or other drug use (Cloninger et al. 1985; Johnson et al. 1984). Furthermore, through development of expectations regarding their children's drug use or friendship choices, parents often influence the risk factor of early first use of drugs (Kandel 1982; Robins and Przybeck 1985) and having friends who use alcohol or other drugs (Brook et al. 1990; Elliott and Menard, in press). Conversely, parenting-related characteristics such as parental support for child competencies, parental warmth and affection, and presentation of clear, prosocial normative expectations can serve as protective factors against the development of health and behavior problems in children (Brook et al. 1990; Catalano and Hawkins 1996; Coie et al. 1993; Coombs and Landsverk 1988; Farrington et al. 1990; Hawkins et al. 1992; Masten 1994; Masten et al. 1990; Rutter 1990; Yoshikawa 1994). Enhancing protective factors in the family environment may be particularly important as children enter the middle-school years and move from childhood into early adolescence. During this period, the increasing influence of peers and the transition from elementary- to middle-school environments may increase a child's exposure to a variety of risks (Catalano and Hawkins 1996; Eccles et al. 1993; Simmons and Blyth 1987).

Research has shown that training in parenting skills can help parents learn to avoid specific parenting practices that increase risk for adolescent problem behaviors (Farrington and Hawkins 1991; Hawkins et al. 1992; Patterson and Stouthamer-Loeber 1984). In addition, a number of studies indicate that the use of consistent and contingent childrearing practices (Fraser et al. 1988; Loeber and Stouthamer-Loeber 1986) as well as problemsolving techniques (Kazdin et al. 1992; Spaccarelli et al. 1992) can be successfully taught to parents.

Studies of parent training programs for parents of children in late childhood and early adolescence often fail to include adequate control groups or sample sizes to draw confident conclusions regarding effectiveness (Todres and Bunston 1993; Wiese 1992; Yoshikawa 1994). In addition, few studies with strong designs have examined the effectiveness of parent training when offered as a universal prevention intervention (Institute of Medicine 1994).

Developmentally appropriate universal prevention interventions with parents need to be adequately tested (Coie et al. 1993). Adequate sampling, appropriate measurement methods and statistical models, and checks for fidelity of intervention implementation should be used to ensure methodological rigor. In addition, the theoretical base of prevention interventions should be sufficiently articulated to allow for empirical testing and replication of significant findings (Chen and Rossi 1987; Coie et al. 1993).

PREPARING FOR THE DRUG-FREE YEARS

PDFY is an example of a universal prevention program targeted at parents of preadolescents. This program has been conducted in several large-scale dissemination and effectiveness studies. The curriculum was field-tested for 2 years in 10 Seattle public schools. In these schools 52 percent of the students were people of color, 48 percent were low income (eligible for free lunch program), and 39 percent were from single-parent families. In addition, the curriculum had been tested as part of a regional broadcast media program, tested in different statewide implementations, tested within a health maintenance organization (HMO), and implemented in a project focusing on families of color.

This report summarizes results of studies of the PDFY universal prevention program for parents of preteens. The goal of the PDFY curriculum is to empower parents of children ages 8 to 14 to reduce the risk that their children will develop problems with other drugs and alcohol in adolescence. PDFY teaches parents how to reduce critical risk factors and enhance protective factors that are especially important during the late elementary and middle-school years. It is designed to effectively reach adult learners regardless of learning style or level of education.

THEORETICAL UNDERPINNINGS OF PDFY

The curriculum is guided theoretically by the social development model (Catalano and Hawkins 1996; Farrington and Hawkins 1991; Hawkins and Weis 1985; Hawkins et al. 1992). The social development model is an integration of social control, social learning, and differential association theory. Like social control theory (Hirschi 1969), the model views bonding as a protective factor. Bonding consists of attachment and

commitment. In addition, bonding is expected to lead to the acceptance of the beliefs and standards of the person to whom one is bonded. When these beliefs are healthy, they also serve as a protective factor. The model incorporates processes specified in social learning theory (Akers 1977) to explain and predict conditions under which bonding develops. It utilizes differential association theory to account for the differential influence of being bonded to prosocial or antisocial others.

The social development model emphasizes the role of bonding to prosocial family, school, and peers as protection against the development of conduct problems, school misbehavior, and drug abuse. It hypothesizes that strong bonding to prosocial others reduces the probability of delinquency and substance abuse. Bonding to the social unit, in this case the family, is hypothesized to result from a protective process involving three factors: (1) the extent to which prosocial opportunities for involvement in the family are available to the child; (2) the skills the child uses in participating in the family to complete tasks, solve problems, and interact with others; and (3) the rewards and punishments provided by parents for behaviors that conform to or violate the family expectations and beliefs.

Guided by this model, PDFY seeks to reduce adolescent drug abuse and behavioral problems by increasing opportunities for involvement and interaction between parents and children, teaching parents and children skills to resist peer pressure and refuse to engage in inappropriate behavior, increasing rewards for prosocial behavior through practicing consistent and contingent family management, and managing and reducing family conflict. The content and format of this parent training intervention are described below.

THE PDFY CURRICULUM

PDFY was originally developed by Hawkins and Catalano for Developmental Research and Programs for use in the Seattle Social Development Project, a longitudinal research study funded by the National Institute on Drug Abuse. The program was field-tested with parents in an urban, multiethnic community and has been subsequently used with urban, suburban, and rural families. Since its introduction in 1987, PDFY has been used in over 30 States and in Canada. More than 120,000 families have been trained in the program.

The program is commercially available through Development Research and Programs and is easily delivered by community members who have been taught to conduct the workshops by trainers from the company. This training is a 3-day course that provides workshop leaders with a detailed overview of the program content as well as tips and practice sessions focusing on how to deliver the program to parents in their communities. The program has been offered to parents in schools, churches, community centers, homes, hospitals, and even prisons across the country. In 1988 PDFY was the focus of a media campaign coordinated with a Seattle television affiliate and broadcast across most of western Washington State. This implementation entailed an hour-long television special followed by community-based workshops in 87 western Washington communities. Most recently, the program has been implemented as part of a two-phase experimental evaluation in rural Iowa. Four States (Oregon, Kansas, Illinois, and West Virginia) have sponsored statewide implementations of PDFY.

PDFY consists of five 2-hour sessions (it has recently been adapted to be offered as 10 1-hour sessions to accommodate implementation in the workplace). Sessions are typically conducted by two trained workshop leaders from the community. The curriculum kit consists of a workshop leader's guide; a companion videotape series, one for each session; and a family activity book for each participating family. The workshop leader's guide provides a statement of session objectives, a list of materials needed, and a scripted overview of the curriculum. In addition, the guide includes detailed information on how to conduct the parenting workshops and provides a sample recruitment brochure. The companion videotapes are used with the curriculum to model a variety of the targeted skills, to present an accurate summary of the curriculum material, and to present discussions by parents about how the program worked in their families. The family activity book is also designed to summarize the curriculum material, as well as provide transfer (family meeting agendas) and extension activities for the family. The book includes pullout pages for families to post in their homes. To supplement this kit, a variety of optional materials are available. These include a question-and-answer audiotape about risk factors to assist workshop leaders in answering difficult questions, an "ethnic adaptation guide" to assist with tailoring the curriculum for specific ethnic groups, and a "drug-free tool kit," which provides aids for recruitment and retention of parents.

The curriculum sessions themselves are based on three important assumptions: first, that parents can play an important role in the reduction of risk factors for other drug and alcohol use by their children; second, that parents can take an active role in the enhancement of protection for their children by offering them opportunities for involvement within the family, teaching them skills to be successful, recognizing and rewarding their involvement, and communicating clear family norms on alcohol and other drug use; and third, that regular family meetings provide a mechanism for family involvement and serve as a tool to transfer content and skills learned in the workshop into the home environment. The curriculum content includes the following:

- Session 1—"Getting Started: How To Prevent Drug Abuse in Your Family" provides an overview of the program and of family and individual risk factors for substance abuse. Participants learn a simplified version of the social development model including a description of how family bonding and clear norms or standards are protective factors for preventing adolescent health and behavior problems and how, as parents, they can strengthen bonds by providing children with opportunities for involvement in the family, skills to be involved successfully, and reinforcement or rewards for prosocial family involvement. In this session, parents practice the steps for conducting a family meeting to plan a joint fun activity as one mechanism for increasing family opportunities for rewarding involvement.

- Session 2—"Setting Clear Family Expectations on Drugs and Alcohol" focuses on reducing the risk factors of poor family management, favorable attitudes toward substance use, and early first use of other drugs or alcohol. Parents are trained to clarify their own expectations on alcohol and other drug use. They are taught how to develop family guidelines and monitoring strategies, as well as clear consequences for following or breaking the stated family rules on alcohol and other drug use. Parents learn to enhance protective factors by involving their children in creating a family policy about alcohol and other drugs in a family meeting.

- Session 3—"Avoiding Trouble" focuses on the risk factors of friends who use drugs, antisocial behavior in early adolescence, and early first use of alcohol or other drugs. Children attend this session with their parents. Together they learn skills to resist peer influence to use other drugs or alcohol or engage in antisocial behavior, using the

five steps of "Refusal Skills." The skills are taught using the cognitive behavioral techniques of introduction, discussion, roleplay, and feedback. Well-developed skills in peer resistance increase protection against problem behavior.

- Session 4—"Managing Family Conflict" is aimed at reducing the risks related to family conflict, as well as alienation and rebelliousness. Parents learn skills to express and control anger without damaging family bonds.

- Session 5—"Strengthening Family Bonds" explores ways parents can strengthen protection by expanding opportunities for involvement in the family as children mature. Parents learn skills to express positive feelings and love to their children. In addition, they are provided with a process for developing a parenting support network to continue beyond the PDFY sessions.

At the end of each session, a family meeting is assigned to be completed during the week to transfer session content to the home setting. Each session provides parents with an opportunity to practice holding their family meeting.

EVALUATION STUDIES

Evaluations of universal interventions must address two major issues. First, since such programs are designed for the general public, the success of dissemination efforts should be assessed. The questions to be addressed are: Does the program have a strategy for dissemination? Can a broad cross-section of parents be recruited for participation? And, Is the program acceptable, or can it be adapted to be acceptable, to diverse groups? The second issue is the efficacy of the program. The questions here concern the immediate, proximal goals of the intervention, as well as more distal goals: Does the program reduce targeted risk factors and/or enhance protective factors? Does it achieve the ultimate goal of reducing substance abuse? Table 1 outlines the key features of several PDFY evaluation studies.

TABLE 1. *Evaluation studies of Preparing for the Drug-Free Years.*

Study	Sample Evaluated	Number of Participants	Recruitment Procedures	Workshop Leaders	Design	Followup and Dropout	Assessment Method	Key Findings
Hawkins et al. 1991	Seattle, WA, area families; 90% white	98,000 viewed TV special; 2,497 attended workshops; 250 to 401 evaluated	Primetime TV special, PSAs, widespread distribution of written promotional material	Volunteer community leaders nominated by host sites	Single-group pretest-posttest	Immediate followup after each session; 38% dropout through program	Self-report questionnaires	Mean program ratings of 4.8 to 5.6 on 1-6 scale (6 = high value and quality); significant knowledge, attitude, and self-reported behavioral impacts on 23 out of 30 planned comparisons; 59% reported holding a family meeting
Heuser 1990	Families across Oregon; 17% targeted as high risk; 84% white	509 to 759 evaluated	Radio, TV, and newspaper; posters and brochures, announcements at churches, schools, public agencies	Community members	Single-group pretest-posttest	Immediate followup after each session; 33% dropout through program	Self-report questionnaires	Mean program ratings of 8.5 to 9.1 on 0-10 scale (10 = high value); significant knowledge and attitude impacts on 28 out of 36 planned comparisons for non-high-risk group; 61% and 49% of the two groups reported holding family meeting, respectively

TABLE 1. *Evaluation studies of Preparing for the Drug-Free Years (continued).*

Study	Sample Evaluated	Number of Participants	Recruitment Procedures	Workshop Leaders	Design	Followup and Dropout	Assessment Method	Key Findings
Holcomb and Schulte 1993	Families across Kansas			Community volunteers	Single-group pretest-posttest	Immediate followup after each session	Self-report questionnaires	91% to 94% reported positive attitudes about the program and its usefulness, up to 22% improvement in reported knowledge gain and skills aquisition
Hawkins et al. 1994	Families of pediatric patients in HMO clinics in Seattle; 90% white	945 families contacted; 58 attempted to register; 24 to 30 evaluated	Letter from families' pediatricians recommending program; families asked for $25 fee	Pairs of co-leaders, one a parent and one having prior experience	Single-group pretest-posttest	Immediate followup after each session; 20% dropout through program	Self-report questionnaires	Mean program ratings of 4.3 to 5.5 on 1-6 scale (6 = high value and quality); significant knowledge and attitude impacts on 8 of 40 planned comparisons; 75% reported holding family meeting

TABLE 1. *Evaluation studies of Preparing for the Drug-Free Years (continued).*

Study	Sample Evaluated	Number of Participants	Recruitment Procedures	Workshop Leaders	Design	Followup and Dropout	Assessment Method	Key Findings
Harachi et al. 1996	Ethnic minority families in Seattle area; 46% Hispanic, 20% African-American, 17% Samoan, 6% Native American	455 attended workshops	Community networking; announce-ments, calls, and brochures at social networks and structures serving minority populations	Community members whose ethnicity and spoken language were congruent with targeted population; leaders trained to adapt program	Single-group pretest-posttest	3-month followup after program (see findings)	Attendance records	55% attended at least half the sessions, 14% attended all sessions (dropout records not comparable as adapted implementations varied in number of sessions); time conflicts most frequently cited for nonattendance
Spoth et al. 1995; Kosterman et al. 1995, 1996	Rural Iowa families	387 families contacted; 209 attended workshops; 175 evaluated	All families of 6th and 7th graders in targeted schools receiving federally supported lunch program were called	Community members	Random assignment to intervention and control groups, pretest and posttest assessments	2- to 9-week followup after program; 16% dropout through program	In-home surveys and videotaped observation of family interactions	All workshop leaders covered core concepts, with 74% to 82% coverage of full curriculum; PDFY parents were significantly more likely to report improved parenting skills and to demonstrate behaviors consistent with the curriculum; further results linked specific improvements to specific PDFY sessions

TABLE 1. *Evaluation studies of Preparing for the Drug-Free Years (continued).*

Study	Sample Evaluated	Number of Participants	Recruitment Procedures	Workshop Leaders	Design	Followup and Dropout	Assessment Method	Key Findings
Spoth and Redmond 1995	Rural Iowa families	360 families evaluated	All families of 6th graders in targeted schools receiving federally supported lunch program were called	Community members	Random assignment by school to intervention and control groups, pretest and posttest assessments		In-home surveys and videotaped observation of family interactions	PDFY parents were significantly more likely to report improved parenting skills; child management skills appeared to be impacted by parent training and in turn impacted intentions to use alcohol

PDFY DISSEMINATION AND DESCRIPTIVE FINDINGS

Early tests of PDFY were primarily designed to test dissemination efforts, although they also often included pretest and posttest assessments of program effects. These studies include a regional broadcast media campaign to attract PDFY participants, statewide dissemination efforts, a program implemented through an HMO, and one study specifically targeting ethnic minority families.

Broadcast Media Dissemination

An early study by Hawkins and colleagues (1991) is notable in the scope of the program's exposure to a broad sample. This intervention began with a 1-hour television special airing at 9 p.m. on a Tuesday evening on the local NBC affiliate. The broadcast covered the greater Seattle-area media market. An estimated 98,000 households viewed the program, which dramatized the consequences of teenage drug abuse, reviewed risk factors for drug abuse, and presented family risk reduction strategies. Public service announcements regarding the existence and locations of PDFY workshops continued throughout the day and evening for 2 weeks prior to the campaign, and written promotional materials were distributed throughout the area. A total of 87 different workshop sites were established in the area. Workshops were led by community members who had attended a 3-day training program.

As shown in table 1, at least 2,497 participants voluntarily attended the workshops. An evaluation of the PDFY curriculum was conducted at a sample of 20 sites, stratified for rural, suburban, and urban locations. At these sites, 401 (first session) and 250 (last session) participants completed questionnaires both before and immediately after each workshop. The parents were 90 percent European-American, and most had children in grades 4 through 7 (the targeted age). The data indicated that the majority of participants (53 percent) had viewed the television special and had learned about the workshops either through this special (29 percent) or through their child's school (72 percent; multiple responses were allowed). Interestingly, only 21 percent of participants said they had learned of the workshops through televised public service announcements. This recruitment strategy was able to reach beyond those who traditionally attend parent workshops; 65 percent had not previously attended a parenting workshop. Although attendance dropped from the first session to the final session, approximately 69 percent of the original attendees remained. Following the curriculum, participants

reported that they found the workshops very acceptable. Overall sessions, exercises, and materials, as well as workshop content, process, and leaders, were all rated highly (on a scale of 1 = not worthwhile/poor to 6 = very worthwhile/excellent, means ranged from 4.8 to 5.6).

Participants were also asked to report knowledge, attitudes, and behaviors relevant to the goals of the program. Planned comparisons of linked pretest and posttest scores were conducted across 30 separate measures. Of these 30 measures, 23 showed significant improvement. Among other changes, participants at posttest were more likely to understand the importance of good family management and an explicit family policy on drugs, to show increased motivation to teach and practice refusal skills, to endorse the importance of expressing anger constructively so as to not weaken family bonds, and to agree with the importance of involving adolescents in new family roles. Also, over the course of the workshops, at least 59 percent reported having conducted a family meeting as instructed in PDFY (only 29 percent said they had periodic family meetings previously). Although these results are only suggestive, since there was no comparison group, they indicate that the program was acceptable and that key points were successfully communicated to a general population sample of participants. Moreover, a majority of participants reported having put an integral component of the program into practice (conducting a family meeting).

Statewide Dissemination

The most fully documented statewide dissemination study was conducted in Oregon (Heuser 1990). PDFY was implemented with families across 32 counties and within 4 State agencies. In all, 195 workshop groups were organized, 10 of which specifically targeted families whose parents were clients of various State agencies (e.g., adult and family services, Oregon Department of Corrections). All groups were led by trained community members. A representative sample of 46 workshops was selected for evaluation (including 8 of the 10 State agency workshops), which included 759 participants. This sample was 84 percent European-American, and the majority consisted of parents of children in grades 4 through 6 (54 percent).

Families were recruited for the study with radio, television, and newspaper announcements, distribution of posters and brochures, and announcements at churches, schools, and public agencies. Most participants reported hearing about the workshops through their child's

school (45 percent) or from a friend or family member (34 percent), although most State agency participants were recruited directly by the agency. Again, a large proportion of those recruited had never attended a parenting workshop. Sixty-five percent of the public and 68 percent of the agency participants had never attended a parenting workshop before, and over 90 percent of both groups had never attended a drug abuse prevention workshop. Over the course of the workshop sessions, overall attendance fell approximately 33 percent; dropout was different among the two groups—approximately 31 percent in the public group and 42 percent in the agency group. However, following each workshop, participants indicated that they found the curriculum acceptable. On a scale of 0 (no value at all) to 10 (highest value), they were asked to rate the value of the workshop for "your plans to work with your children to prevent drug abuse." Mean responses ranged from 8.5 to 9.1.

In assessing the effectiveness of the program in terms of knowledge gain and attitude change, paired *t*-tests were used to compare pretest and posttest scores across 36 different items. These analyses were conducted separately for the non-high-risk "public" sample and the "agency" sample. For the public sample, significant differences in the desired direction were found for 28 of the 36 items. Among the agency sample, there was significant improvement in 16 of the 36 items. When asked specifically about having had a family meeting in the past week, as instructed in each PDFY session, up to 61 percent of the public families reported having done so, and up to 49 percent of agency families answered affirmatively.

Another statewide dissemination of PDFY took place in Kansas (Holcomb and Schulte 1993). Although the specifics of implementation and effectiveness are not as well documented, the effort was extensive, involving over 500 trained volunteers to lead workshops across the State. As before, almost all participants (91 percent to 94 percent) reported positive attitudes about the program and its usefulness. They also reported substantial knowledge gain and skills acquisition (up to 22 percent improvement) in response to most sessions, and 84 percent to 90 percent felt they had learned how to implement new skills at home.

Together, these findings indicate that statewide implementations of PDFY have been successful in targeting the intended audience (parents of preteens) and that these parents find the program acceptable and of high value. In addition, although results vary, there are indications that PDFY sessions are improving parents' knowledge and changing important

attitudes and behaviors relevant to later teen substance use. Although they did not include a documented evaluation, other statewide disseminations of PDFY have been implemented in Illinois and West Virginia.

Dissemination in a Health Maintenance Organization

Another implementation of PDFY involved dissemination in an HMO in Seattle, Washington (Hawkins et al. 1994). Specifically, four pediatricians in two HMO clinics sent letters to parents of each of their patients ages 9 to 13. This letter announced the availability of the parent training program and recommended that the parents attend. Participants were asked to pay a $25 registration fee, although partial scholarships were available to parents who could not afford the fee.

All together, 945 families were contacted by letter, and among these, 58 families called to register for the program. However, the training capacity of the two clinics allowed for only 38 families. Attendance remained fairly high from the first session (88 percent of the 38 possible) to the final session (71 percent). Ninety percent of these families were European-American. The PDFY sessions were conducted by two trained coleaders, one a parent and one having prior experience in leading workshops.

As before, parents were asked at the end of each session to assess the value of the workshops. On a scale of 1 (not worthwhile/poor) to 6 (very worthwhile/excellent), means ranged from 4.3 to 5.5, indicating widespread acceptability of the program. In addition, using the same single-group pretest-posttest design as in the prior studies, paired *t*-tests showed significant knowledge gain and attitude change in the desired direction on 8 out of 40 self-report items. Seventy-five percent of parents also reported holding a family meeting as instructed in PDFY.

This study supports previous findings that the program is attractive to parents and that they find participation to be of value. It is noteworthy that participants were recruited on the basis of a single letter from their physician and paid a $25 registration fee. This result suggests that physician endorsement may be a potential tool in dissemination. Knowledge, attitude, and behavior effects were also consistent with prior studies; there were significant indications of improvement, and at least three out of four parents reported following through with a family meeting.

Dissemination in Ethnic Minority Communities

A PDFY study by Harachi and associates (1996) spanned 2 years and specifically targeted families of color. Naturally existing social networks or structures serving minority populations were identified for recruitment and for workshop sites. For example, a church that conducts services in Spanish proved to be helpful in recruiting Hispanic American participants. The project staff contacted such locations to solicit support for the program and to locate workshop sites. In addition to churches, community recreation centers, schools, and social service agencies were often very helpful. Many parents were recruited by trained recruiters hired from the targeted communities and by direct calls placed by workshop leaders, as well as by informational brochures left at targeted locations. In addition, recruiters contacted personal networks and made announcements at community events, and some door-to-door efforts were organized. Calls were made from various directories and lists were provided by cooperating organizations, such as schools, churches, and community associations.

Workshops were conducted by trained community members whose ethnicity and spoken language (when English was a second language) were congruent with that of the target population. Throughout the training, workshop leaders were encouraged to adapt the PDFY curriculum to meet the specific needs of the families in their target communities. The training included examples of how the program content could be tailored to different audiences and how delivery methods could be tailored to different learning styles across cultures. One initial adaptation made by the group was to market the workshops as a program to "strengthen and support families" rather than explicitly for drug abuse prevention. Workshop leaders felt that this better communicated the positive focus of the program.

In all, 27 different workshops were implemented, with a total of 455 participants. Only 7 percent were European American; 46 percent of the participants were Hispanic American, 20 percent were African American, 17 percent were Samoan American, and 6 percent were Native American. Over 64 percent of the sample were foreign born. The most effective recruitment mechanisms for these different groups included strategies to access personal social networks, such as churches (Hispanic Americans and Samoan Americans), schools (African Americans), and friends (Samoan Americans and Native Americans). Although this evaluation did not assess satisfaction or effectiveness of the program

directly, it did report attendance patterns. Approximately 55 percent of participants attended at least half of the sessions offered. (The study did not report specific dropout rates from first to final sessions since workshop leaders often added sessions, depending on the needs of their specific groups, and dropout rates would not be comparable with other studies.) Many parents reported varying work schedules and other time conflicts as the most frequently cited reason for nonattendance. Nevertheless, most parents (71 percent) had never attended any kind of parenting workshop before, and 85 percent had never attended a drug abuse prevention workshop before. The turnout reported here suggests both the need for prevention workshops in diverse communities (Hawkins and Salisbury 1983) and the efficacy of using culturally appropriate recruitment strategies.

PDFY EFFECTIVENESS: EXPERIMENTAL FINDINGS

Pilot Phase

Most recently, the PDFY curriculum has been tested experimentally with families in rural Iowa. This study is part of Project Family, a series of studies conducted at Iowa State University in collaboration with the Social Development Research Group at the University of Washington. In the initial pilot phase of this project (Spoth and Redmond, in press-*a*, 1995; Spoth et al. 1995), all families with sixth- and seventh-grade children in nine different schools were called and invited to participate (N = 387). The schools had been selected from districts meeting eligibility requirements for the federally supported school lunch program. Although not all families were eligible for school lunch benefits, the median annual family per capita income was $6,800 ($27,200 for a family of four). A total of 209 families completed the initial pretest, and 175 (84 percent) of these families completed the final posttest assessment. Each family was offered a financial incentive of approximately $10 per hour per family member for time devoted to study assessments. No monetary incentives were provided for intervention attendance. Virtually all participants were European-American.

Attendance records indicate that most parents assigned to the intervention group attended most of the PDFY sessions; 88 percent of enrolled mothers and 69 percent of enrolled fathers attended three or more sessions; nearly half of the mothers (47 percent) and a third of the fathers (32 percent) attended all five sessions. The mean rates of attendance

were 3.9 sessions for enrolled mothers and 3.1 sessions for enrolled fathers.

This experiment involved more extensive data collection regarding effectiveness than the previous studies. In addition to more indepth written questionnaires assessing knowledge, attitudes, and self-reported behavior, families were also videotaped in two structured interaction tasks, one of which focused on general questions concerning family life (chores, roles, parental monitoring) and the other of which was directed toward family problems and family problemsolving. After randomly assigning the families to the intervention condition or the wait-list control condition (to receive the curriculum following data collection), questionnaires and videotaping were completed at both pretest and posttest. Posttest assessments occurred approximately 2 to 9 weeks following the PDFY sessions. The wait-list control condition received no intervention during this time. PDFY workshops were led by members of the communities in which they were conducted (workshop leaders received 4 days of training). Data were also collected on the fidelity of the PDFY implementation by these leaders.

Results of this evaluation provided the strongest evidence yet for both the fidelity of PDFY when administered by community members in an efficacy trial (Institute of Medicine 1994), as well as the impact of the program itself in teaching skills and changing behaviors. Observations of workshop leaders revealed that, although there was some variability in coverage of program content, each of the pairs covered most of the full curriculum and that each pair of leaders covered each of the core program concepts. The observation scores ranged from 74 to 82 percent coverage of the full PDFY curriculum content.

With regard to program impact, analyses of parent outcome measures (controlling for pretest measures) indicated significant overall improvement on intervention-targeted parenting behaviors, general child management, and parent-child affective quality, for both mothers and fathers in the intervention group (Spoth and Redmond 1995; Spoth et al. 1995). In other analyses examining these data, individual constructs targeted by the specific intervention sessions were tested separately, using both the self-report and videotaped assessments (Kosterman et al. 1995, 1996). Specifically, results indicated that mothers in the PDFY group were significantly more likely to report that they gave or expressed rewards to their child for prosocial behavior, to communicate rules regarding substance use, to punish their child appropriately for misbehavior, to

restrict their child's alcohol use, to expect their child to refuse a beer from a friend, to express less conflict toward their spouse, and to work at being more involved with their child. Fathers in the intervention group also reported significantly more communication with their child about rules regarding substance use, as well as more involvement with their child. The observational measures were consistent with these self-report findings. Mothers in the intervention group exhibited significantly more proactive communication and less conflict than did control mothers, as well as improved relationship quality or bonding with their children (although the latter finding was significant at only $p < 0.06$). Intervention fathers also exhibited significantly more proactive communication and improved relationship quality or bonding. All of these outcomes were explicitly targeted by specific sessions in the PDFY curriculum.

As a further check on the validity of these findings, additional analyses examined (1) the effects of the intervention on outcomes that were superficially similar to targeted measures, but which in fact were not targeted by PDFY, and (2) increments in improvement when the intervention group was restricted to only those who attended specific PDFY sessions (Kosterman et al. 1996). These analyses were conducted in order to demonstrate that specific PDFY objectives were linked with specific outcomes and that these effects were not due to more global causes, such as experimenter-demand effects. Indeed, no significant differences between intervention and control parents were found among the six nontargeted constructs examined in this study. For example, while mothers in the PDFY group reported being more likely to reward their child (as instructed in PDFY), they were not significantly more likely to receive rewards from their child, nor reward or receive rewards from their spouse (not instructed in PDFY); while both mothers and fathers assigned to PDFY reported more involvement with their children (included in PDFY), they did not report more involvement with each other (not in PDFY). Along similar lines, there was evidence that the subgroup of parents that actually attended specific workshops showed greater improvement on constructs targeted in those workshops compared with the entire experimental group, which included nonattendees. Compared with the entire experimental group, the attendees demonstrated more improvement for 19 out of 28 (68 percent) targeted constructs, but only 4 out of 12 (33 percent) nontargeted constructs. These findings help to further link improvement in specific behaviors to attendance at specific PDFY sessions.

Trial Phase

Preliminary results are also available from an experimental study with followup assessments also involving rural Iowa families (see Spoth and Redmond, in press-*b*). Most of the critical features of this experiment were identical to the prior study, except for the inclusion of a larger sample, a school-based random assignment to condition (i.e., all students at the same school were randomly assigned to the same condition), and a longer followup period (1 and 2 years postintervention). In all, 360 sixth-grade students and their parents completed both pretest and posttest measures. Among enrolled families, 93 percent attended three or more sessions, and 63 percent attended all five sessions. Initial findings replicate those of the pilot study. Among parents assigned to the PDFY curriculum, intervention-targeted parenting behaviors showed significant improvement for both mothers and fathers, consistent with PDFY objectives (no within-condition school-level effects on these measures were found). Results of the 1-year followup remain to be assessed; the second-year data collection has just begun.

SUMMARY

Together these studies provide promising evidence that the PDFY program is appropriate for general and diverse populations and that it can be successfully disseminated (most parents recruited to the program attended most sessions, and most of those who attended had not attended parenting workshops or drug abuse prevention workshops previously). Furthermore, these studies show that, most importantly, PDFY improves parenting practices in ways that reduce risk factors and enhance protective factors for substance abuse among young people. The initial pretest and posttest single-group evaluations described here demonstrate the acceptability and the applicability of PDFY, as well as the program's effectiveness in teaching key parenting concepts to a very broad voluntary audience. These studies also suggest that participating families are likely to implement family meetings, a central objective of the curriculum. The authors' experimental findings are promising in several respects. As before, this study demonstrates the applicability of PDFY in an efficacy trial; data from the observations of workshop leaders support the viability of training community members to lead workshops. In addition, the study shows that most parents, once they agree to participate in the program, attend most of the PDFY sessions. The experimental design of this study, the availability of observational

measures, the analyses linking effects of PDFY primarily to targeted constructs, and the fact that the results were generally stronger for those attending specific sessions all help to build a strong argument for curriculum effects on key risk and protective factors.

IMPLICATIONS FOR RESEARCH WITH UNIVERSAL PREVENTION FAMILY INTERVENTIONS

The current evaluations being conducted as part of Project Family are an example of a research project that addresses a number of issues cited in the literature and important to universal prevention (Spoth and Redmond, in press-*b*). The project employs an experimental, longitudinal design with an adequate sample size to achieve the required statistical power to detect group differences. In addition, the project utilizes multi-informant, multimodal measures, including self-reports from parents and their children, as well as videotaped observational measures. Finally, implementation fidelity checks have been incorporated into the intervention delivery using a structured observational process (Melby et al. 1990; Spoth and Redmond, in press-*a*; Spoth et al. 1995).

Several additional implications for future universal prevention research can be drawn from this review. First, evaluating the success of dissemination efforts requires careful documentation of recruitment procedures and measures of the effectiveness of recruitment methods. A number of studies have been conducted through Project Family to investigate a variety of recruitment and retention issues. These include using consumer research methods to evaluate parent preferences concerning family-focused prevention interventions (Spoth and Molgaard 1993; Spoth and Redmond 1993), analysis of sociodemographic and health belief influences on family participation in these interventions including the use of path analytic approaches (Spoth and Conroy 1993; Spoth and Redmond 1995; Spoth et al. 1993, 1995), the retrospective study of parents' perceived barriers to intervention participation using mail and telephone survey procedures (Spoth and Redmond 1993; Spoth et al. 1995), and the study of predicators of family participation using prospectively collected telephone survey data on theory-based predictors (Spoth et al. 1995). Analysis of the effectiveness of different recruitment strategies should examine the message (what is said), the messenger (who is saying it), and the medium (how the message is delivered) (McGuire 1980). Furthermore, the impact of incentives and barriers to

participate and their effect on recruitment and retention should be examined vigorously.

Despite generally high levels of involvement in PDFY by general population parents targeted by Project Family, there are some major constraints on involving them in family-focused prevention intervention programs. Especially noteworthy are competing time demands or scheduling conflicts and attitudinal factors associated with parent disinclination to participate. For example, over several studies, competing time demands and scheduling conflicts repeatedly emerged as major barriers to parent participation, largely independent of parents' sociodemographic characteristics (e.g., Spoth and Redmond 1993, 1994; Spoth et al. 1995). Clinical evidence readily demonstrates the necessity for child care, transportation, ethnic and gender match between parents and workshop leaders, and monetary or other incentives. However, little empirical work has been completed on the impact of these workshop elements on recruitment and retention.

The second critical issue facing universal parenting intervention research involves how investigators evaluate the process and mechanisms of family change. Future research should seek to evaluate how the universal parenting program changes individuals and how individual change affects relationships in families. This requires using multimodal, multi-informant measurement, a longitudinal design, and frequent measurement. A greater understanding of the complex nature of how families utilize an intervention to actually change risk and protective factor processes, as well as substance use, may be possible with careful documentation of the multiple changes and the sequence of changes families experience (Spoth, this volume; Spoth and Redmond, in press-*a*). Furthermore, this type of research will allow an investigation of individual differences influencing variations in outcomes (e.g., Spoth et al. 1995). Understanding the change process and mechanisms and variations in outcomes among families is a key to the development of maximally effective interventions.

Finally, the question of how to deliver content and teach skills from parenting and family programs to universal populations warrants further investigation. In addition to large-scale workshop implementation, consideration of other methods to effectively deliver program content to families is needed. Alternatives to delivering parenting workshops at community locations need further investigation. Examples of such alternatives include using book and/or video home-study sessions,

providing parenting information on the World Wide Web, sending program content to families in monthly utility bills or through inclusion in grocery store sacks, television specials or series illustrating universal parenting and prevention approaches, or delivery of services in the home by trained lay personnel. Widespread dissemination of programs shown to be acceptable, applicable, and effective is the best hope for preventing one of society's most prevalent and costly problems—the abuse of alcohol and other drugs.

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ACKNOWLEDGMENT

Work on this chapter was supported by National Institute on Drug Abuse research grant no. DA07029-01A1.

AUTHORS

Richard F. Catalano, Ph.D.
Associate Director and Professor

Rick Kosterman, Ph.D.

Kevin Haggerty, M.S.W.

J. David Hawkins, Ph.D.
Professor and Director
Social Development Research Group
University of Washington
9725 Third Avenue N.E., Suite 401
Seattle, WA 98115

Richard L. Spoth, Ph.D.
Project Director for Prevention Programming and Research
Social and Behavioral Research Center for Rural Health
Center for Family Research in Rural Mental Health
Iowa State University
2625 North Loop Drive, Suite 500
Ames, IA 50010

Selective Prevention Interventions: The Strengthening Families Program

Karol L. Kumpfer

INTRODUCTION

This chapter discusses research-based interventions for selective (targeted) interventions to prevent the onset of substance abuse in high-risk children. The overview explores the merits of selective prevention programs to reduce the risk of substance abuse in subgroups of high-risk youth or adults. The remainder of this chapter explores the program description, principal components, original National Institute on Drug Abuse (NIDA) research results, and later Center for Substance Abuse Prevention (CSAP) multicultural replications of the Strengthening Families Program (SFP).

SFP was first developed as a selective prevention program for elementary school-age children of substance abusers. In demonstration/evaluation replication over the past 8 years, however, SFP has proven effective for other high-risk, conduct-disordered children and other culturally diverse youth (Kumpfer and Alvarado 1995). The hallmark of this selective program is its design for children living in high-risk families. Some of these children have no actual behavioral or emotional problems, but on average their multiple risk factors make them at risk for later substance abuse (Bry et al. 1982), delinquency, and school problems (Seifer et al. 1992). To address these multiple individual and family risk factors, this intensive 16-week family skills training program involves the children in a social skills training program, the parents in a behavioral parent training program, and the total family in behavioral family therapy.

SELECTIVE INTERVENTIONS: THE SECOND WAVE OF PREVENTION

Because of inadequate funds and the increasing numbers of children raised in multiple-risk families, prevention practitioners and researchers have begun to emphasize selective, targeted interventions (Kumpfer

1987). While prevention programs have traditionally been organized into a continuum of primary, secondary, and tertiary prevention, the increased emphasis on creating prevention programs that match the risk needs of subgroups or individuals required a more precise prevention classification scheme (Gordon 1987; Institute of Medicine 1994). The new prevention continuum includes a finer breakdown of primary prevention into universal, selective, and indicated prevention interventions. In this scheme, the prevention category (universal, selective, or indicated) targets those the program is designed to serve and their risk factors (Lorion et al. 1989).

Selective prevention interventions, in contrast to universal prevention interventions, are targeted to high-risk individuals or families as members of subgroups. These program recipients are defined as belonging to a segment of the population characterized by epidemiologically or empirically established risk factors, such as demographic risk factors, psychosocial environmental risk factors, and biological genetic risk factors.

KEY ELEMENTS OF SELECTIVE INTERVENTION PROGRAMS

The distinguishing characteristics of selective prevention interventions are as follows:

- There is a smaller number of participants per intervention group than in universal programs.
- Recipients are known and specifically recruited to participate in the intervention.
- Personal risk is generally not assessed except by belonging to a high-risk group.
- Knowledge of specific risks generally found in the target group allows program designers to sharpen the focus to address specific risk reduction objectives.
- Programs are longer or more intensive.
- Programs are more intrusive into the lives of the participants and aim to change the participants in beneficial ways.

- There is increased probability of controversial content (i.e., discussions with drug-abusing parents of the impact of drug use on their children) or potential negative effects for some participants.

- A larger number of skilled staff members are needed to work with multiproblem youth and families.

- Programs are somewhat more costly per participant because they must target a wider range of risk and protective factors with sufficient dosage to modify the underlying risk status of the individuals in the subgroup.

- Measurable positive effects are more likely because it is easier than in universal prevention programs to identify the recipients; interventions have a more direct effect on risk factors and drug use reduction; more participants have problems that can be improved (less "ceiling effect" than found in universal programs); and focused programs with higher intensity are more likely to have the desired impacts.

The hallmark of selective prevention interventions is not the type of intervention, but who receives the intervention. High-risk groups are recruited without specific individual assessments to ensure that individuals in the group actually manifest the risk factors. Therefore, an intervention determined to be useful in selective prevention programs may also be used for indicated prevention programs for identified individual high-risk youths or adults.

RESEARCH ISSUE: DEFINING APPROPRIATE HIGH-RISK POPULATIONS FOR SELECTIVE INTERVENTIONS

The vulnerable group should be defined as being likely to manifest empirically determined biopsychosocial risk factors shown to be precursors of drug use in the selected population. The most salient domain precursors in etiological research (Kumpfer and Turner 1990/1991) include association with delinquent and drug-using youth, lack of school bonding, lack of social competencies and self-efficacy, stressful or nonsupportive school, and community or family contexts or climate. Certain individual psychological characteristics, such as conduct disorders, aggression, thrill-seeking, and shyness, combined

with anxiety, distinguish high-risk youth (Kellam et al. 1983, 1991; Kumpfer 1987; Zucker and Fitzgerald 1996).

Locating groups of high-risk children with these characteristics for selective prevention programs can sometimes be difficult. Suggestions for places to find high-risk children or youth include (1) children living in high-risk families; (2) children of abusers of alcohol or other drugs in drug treatment or self-help groups (Kumpfer 1996); (3) children of mentally ill and antisocial parents in treatment, (4) children of criminally involved parents (Kumpfer 1996), (5) children living in neighborhoods of high crime and poverty, (6) physically and sexually abused children referred to protective services (Kumpfer and Bayes 1995), and (7) immigrant children experiencing high acculturation stress and conflict with their parents (Kumpfer et al. 1996*b*). Research suggests that some ethnic groups are more biologically at risk, such as Native American children for alcohol abuse and North American children of type II or type B alcoholics (Babor et al. 1992*a, b*; Cloninger 1987; Kaminer 1996).

Note that in no case do researchers know for sure that these youth are manifesting any of the known precursors for drug use. They are simply part of high-risk groups. If certain children are known to manifest specific drug use precursors, such as youth in treatment with diagnosed comorbid mental health problems, youth in special education programs or in alternative high schools because of conduct disorders or academic failure, or youth involved with the criminal justice system, they should be provided with even more intensive indicated prevention strategies tailored to treat these drug use precursors.

Since selective prevention interventions should recruit individuals who are part of high-risk groups, it is critical to define accurately and attract these risk groups. Ideally, selective prevention program development should be preceded by an etiological research study determining the most salient risk factors for substance abuse in the targeted population as was done for Project HI PATHE, a school community change project focusing on high-risk students (Kumpfer et al. 1991). For example, this project included structural equation modeling (SEM) of a hypothesized etiological model of risk and protective factors within major domains (latent cluster variables) of family, neighborhood, school, peer, and individual precursors of drug use (Kumpfer and Turner 1990/1991).

As the prevention field matures, more sophisticated methods have been employed to identify individuals at high risk for substance abuse. Prevention practitioners now have access to more specific etiological research on risk for drug abuse. Improved epidemiological and etiological research has helped in the identification of risk factors for recruitment of high-risk populations. Just as risk factor research has gone through three phases, so the methods for identification of recipients for selective interventions have begun to consider not just demographic risk factors, but also psychosocial environmental risk factors, and recently also biological and genetic risk factors.

Phase One: Demographic Risk Factors

In the first phase of selective prevention interventions, high-risk groups were identified by demographic risk factors, such as gender, ethnicity, age, socioeconomic status, employment, income, education, location of residency, and population density categorical status. Research on these demographically defined risk factors for drug abuse generally indicated that males were more vulnerable than females, white youth more vulnerable than ethnic youth (Trimble 1995), and young adults 18 to 29 years old more likely to use drugs than other age groups. Income or education level per se had little relation to drug abuse, and the western and northeastern regions of the United States, as well as inner-city areas, generally had the highest drug use rates. Survey research studies were often used as the basis for the selection of these demographic risk factors.

Today, many selective prevention programs target high-risk youth or adults by demographic risk factors. However, because of the common belief that ethnic youth are more at risk for drug use, many of these selective interventions have been developed for ethnic youth. Those selective prevention approaches that are designed for youth living in high-drug-use and high-crime communities or towns (i.e., resorts and inner-city neighborhoods) are most likely to be serving high-risk youth. Since selective prevention programs do not actually assess the risk levels in their participants, but select them only on the basis of research-indicated risk factors, it is very important that demographic characteristics that are supported by local data be used to select the participants.

Because each area of the country differs in its reasons for drug use and in its local cultural and socioeconomic climate, generalizations derived from national survey studies about who uses drugs may not match local

household or school survey results. When designing a selective prevention program, prevention practitioners should consult their county and State divisions of substance abuse for local statistics on who uses what drugs. This information is the most valuable in determining who to target for selective prevention programs.

Phase Two: Psychosocial Environmental Risk Factors

In the next phase of risk research, experimental research studies were employed to determine risk factors in addition to epidemiological surveys. This research suggested that the psychosocial environment could provide either hazards or protection for drug use. Some youth live in low-risk communities, neighborhoods, and families and attend supportive schools. Protective environments provide opportunities for involvement with prosocial peers, competency training, and rewards for successful involvement. Psychosocial environmental risk factors identified by research include:

- Community risk factors, including prodrug community values and attitudes, community dysfunction, high-crime and high-drug-use areas, high mobility and stress, poverty, and lack of prosocial institutions

- School risk factors, including prodrug school values and attitudes, school dysfunction and high stress, and school climates that discriminate against certain students or provide less encouragement and support

- Family risk factors, including families characterized by high stress and family dysfunction, few coping skills, and use of alcohol and other drugs

Selective prevention programs that target youth or families on the basis of risk factors that are not individually assessed should identify groups of youth or families that have large doses of these psychosocial risk factors. Subgroups that have been identified for selective prevention programs on the basis of these risk factors include families and youth living in:

- Communities or neighborhoods with high-drug-use and arrest rates, high drug-related crime rates, drug-infested housing projects, and dysfunctional neighborhoods

- Schools with high-drug-use rates and prodrug use norms, many drug-involved gang members, low teacher and student morale, and nonsupportive or nonprotective schools where students do not perceive that teachers care about them and there are few opportunities for youth to be involved in prosocial ways

- Families that are highly stressed or dysfunctional because of death, divorce, incarceration of parents, low income levels, lack of extended family or friend supports, parental mental dysfunction, and parenting problems including child sexual and other abuse

Selective prevention interventions have been developed specifically for children who live with drug-abusing, depressed, mentally ill, and criminally involved parents; reside in dysfunctional neighborhoods; and attend high-drug-use schools.

Phase Three: Biological and Genetic Risk Factors

The newest criteria for selective prevention programs target subgroups of children, youth, or adults suspected of having increased vulnerability to drug abuse because they are children of drug abusers or some other genetically high-risk group of parents (e.g., thrill-seeking or antisocial parents or parents with some type of mental illness).

RESEARCH ISSUE: ACCESSING AND ATTRACTING HIGH-RISK POPULATIONS

Generally, the selective interventions are operated as "pullout" programs in schools or by advertisements to high-risk groups in community agencies. Some programs targeting high-risk youth are operated in publicly funded housing complexes or low-income neighborhoods. The NIDA-funded Strengthening Families Program (Kumpfer et al. 1989) discussed in this chapter is a family-focused selective intervention that has been modified for culturally diverse families. To increase recruitment of at-risk populations, it has been implemented in low-income neighborhood community centers, mental health centers, churches, public housing complexes, drug treatment agencies, and hospitals.

Establishing a positive track record in the community is important for accessing high-risk families. Many federally funded programs,

particularly research programs, are short-term, one-shot interventions. SFP has always been implemented to match the typical services provided by a community agency over the course of years. In this manner, staff and family skills training courses that are provided become known and trusted by the community. Occasionally, site coordinators are used to canvass the high-risk neighborhoods to recruit high-risk families. When this is done, the site coordinators are ethnically matched and generally live (or have lived) in the neighborhood.

RESEARCH ISSUE: RECRUITING AND RETAINING HIGH-RISK FAMILIES

Many prevention practitioners believe that it is "monumentally discouraging" to work with high-risk families and that they are almost impossible to recruit and maintain in family interventions. While this is partially true, particularly in the first cycle of implementing the program before the "bugs" are worked out and staff members become more competent in their jobs, many family skills training interventions, including SFP, report retention rates of around 82 to 85 percent (Aktan 1995; Aktan et al. 1996; Kumpfer et al. 1996*a*; McDonald 1993).

Special recruitment methods are needed to attract and retain high-risk families, as discussed by Kumpfer (1991) in *Parenting Is Prevention: Preventing Alcohol and Other Drug Problems Among Youth in the Family*. Methods used to reduce barriers to recruitment and to retain high-risk families in many selective prevention programs like SFP include child care, transportation, meals, payments for testing time, graduation completion gifts, prizes for completion of homework, and small gifts (pencils, pens, stickers) for the children based on good behavior. Special family outings or retreats are also major attractions in family programs that increase family participation.

RESEARCH ISSUE: LACK OF RESEARCH FUNDING FOR SELECTIVE PREVENTION APPROACHES

Unfortunately, most of the funding for selective prevention programs has come through foundation or CSAP demonstration/evaluation initiatives, which generally do not require research designs with random assignment of subjects. The selective prevention approaches that have been rigorously evaluated have found positive impacts on many risk factors. (See Center for Substance Abuse Prevention [1993]; Goplerud [1991];

and Lorion and Ross [1992] in the special issue of the *Journal of Community Psychology* for reviews of the effectiveness of many selective prevention programs for drug abuse prevention.)

The SFP discussed in this chapter has been evaluated by many different evaluators in a number of sites and was found in one true experimental design and several quasi-experimental (posthoc statistical designs) to reduce the targeted risk factors of family conflict, disorganization, and disengagement; improve youth behaviors and parenting behaviors; and reduce the expectations of children of substance abusers about using drugs and actual drug use, if using (Aktan et al. 1996; Kumpfer et al. 1996*a*). The positive program results were consistent across sites implementing the program even when different evaluators evaluated the program. Six different independent research evaluations have been conducted by researchers based in three departments at the University of Utah. In addition, researchers at the University of Hawaii, Case Western University, Harvard University, and the University of Colorado have evaluated the program on cultural modifications. One doctoral dissertation addressing high-risk, general-population families recruited through schools also supported the positive results. Because SFP appears to be rather robust in terms of consistently favorable results across multiple replications with culturally diverse populations, NIDA selected SFP as an example of a selective prevention program for its Technology Transfer Package on Prevention.

THE STRENGTHENING FAMILIES PROGRAM

SFP (Kumpfer et al. 1989) is a highly structured, 14-week, comprehensive family-focused curriculum. If group assessments are conducted at baseline intake and immediately at the ending of the program, the program is 16 weeks long. SFP includes three conjointly run components: parent training, children's skills training, and family skills training. Each is led by two cotrainers, requiring four trainers for each 2½- to 3-hour session. SFP was originally developed based on the outcomes of a NIDA research grant (1982-1986) with children of drug-abusing parents in treatment in Salt Lake City, Utah.

This section focuses on the history, theoretical underpinnings, development, implementation, and research results of SFP—a family-focused prevention intervention for high-risk families from special

populations. This program has two versions targeting two different high-risk populations:

1. A program for elementary school-age children of drug abusers and their families

2. A parallel intervention for high-risk junior high school students and their families[1]

History

SFP was developed to meet the desire of drug-abusing parents at a methadone maintenance clinic, Project Reality, to improve their parenting skills. These parents wanted their children to have happy and successful lives rather than become drug abusers like themselves. They believed that for their children to do so, they would need to be better, more effective parents. A prior study in five cities (Solder and Burt 1978*a*, *b*) showed that drug-abusing parents spent little time with their children.

Development of SFP began in 1983 as a 3-year prevention research project funded by NIDA. Karol Kumpfer, developmental psychologist, was the author and principal investigator of the project, and Joseph DeMarsh was the project coordinator. They were supported in their efforts to develop the program by a number of local psychologists and national consultants, primarily Robert McMahon of the Department of Psychology at the University of Washington and Bernard Guerney of Pennsylvania State University.

Underlying Theoretical Model of Risk and Protective Mechanisms. In the original Utah study, data on local drug-abusing families were available from a national multisite study of drug-abusing parents and children (Solder and Burt 1978*a*, *b*). The risk and protective factors were then fit into guiding theoretical models. The original model was the Values/Attitudes/Stressors/Coping Skills and Resources (VASC) Model (Kumpfer and DeMarsh 1985). Other models included the empirically tested Social Ecology Model of Adolescent Substance Use (Kumpfer and Turner 1990/1991), basically a domain model, and the Resiliency Model (Richardson et al. 1990), a process model. These theoretical models, empirically supported by advanced statistical analysis procedures (SEM), specify that family environment is an important factor in deterring the use of alcohol or other drugs by youth. Family

climate and parenting factors are the major determinants of self-esteem. Self-esteem is highly related to school bonding and the choice of prosocial friends. Since family environment is a precursor that influences even a child's choice of friends, it is apparent that improving parent-child relations should be a major goal of any prevention intervention program. In addition, it has been found that a positive family climate characterized by supportive parent-child relationships is even more influential in protecting Latino youth from drug use (Kumpfer and Alvarado 1995). Because of the commitment to strong families found in ethnic communities, the author has found that African American, Latino, Asian and Pacific Islander, and Native American parents frequently request family programs from their provider agencies. They want to improve their family relationships and create a family climate that will help them to protect their children from negative influences.

Intervention Theory and Family Research. To impact effectively these family risks in multiproblem families, a multicomponent, comprehensive family-focused approach was selected. Family-focused interventions appear to be more effective than either child-focused or parent-focused approaches. Current reviews of early childhood programs also support this conclusion (Mitchell et al. 1995). In recent years there has been a shift from focusing therapeutic activities primarily on the child to improving parents' parenting skills and recognizing the importance of changing the total family system. Newly developed family-focused skills-training programs are more comprehensive and include structured parent skills training, children's social skills, and parent-child activities, sometimes called behavioral family therapy, behavioral parent training, or family skills training. The new family skills-training approaches often offer a number of additional family support services (i.e., food, transportation, child care during sessions, advocacy, and crisis support). Some examples of these structured family-focused interventions include SFP (Kumpfer et al. 1989), effective with substance-abusing parents and ethnic parents (Kumpfer et al. 1996*a*); Focus on Families (Haggerty et al. 1991), for methadone maintenance parents (Catalano et al., in press; Catalano et al. 1997); the Nurturing Program (Bavolek et al. 1983) for physically and sexually abusive parents; Families and Schools Together (FAST) (McDonald et al. 1991), for high-risk students in schools; and the Family Effectiveness Training (FET) (Szapocznik et al. 1985). (See Kumpfer [1993] and Kumpfer and Alvarado [1995] for reviews of these promising family programs.)

Other researchers are employing these broad-based family skills programs as part of even more comprehensive school-based intervention strategies. The Fast Track program (Bierman et al. 1996; McMahon et al. 1996), one of the largest prevention intervention research projects ever funded by the National Institute of Mental Health (NIMH), is one exemplary program. This selective prevention program for high-risk kindergartners was nominated for the program because of risk factors including conduct disorders and is being implemented in several different sites in the Nation with a large team of nationally recognized prevention specialists, including Karen Bierman, John Coie, Kenneth Dodge, Mark Greenberg, John Lochman, Robert McMahon, and Nancy Slough. Fast Track includes McMahon's behavioral parent training, which is also incorporated in SFP.

One distinguishing feature of these new parent and child skills-training programs, called family skills-training programs, is that they provide structured activities in which the curriculum addresses improvements in parent-child bonding or attachment (Bowlby 1969/1982) by coaching the parent to improve playtime with the child during Child's Game. This special therapeutic play has been found effective in improving parent-child attachment (Egeland and Erickson 1987, 1990). Using intervention strategies developed by Kogan (1980) and Forehand and McMahon (1981), the parents learn—through observation, direct practice with immediate feedback by the trainers and videotape, and trainer and child reinforcement—how to improve positive play (Barkley 1986) by following the child's lead and not correcting, bossing, criticizing, or directing. Teaching parents therapeutic play has been found to improve parent-child attachment and child behaviors in psychiatrically disturbed and behaviorally disordered children (Egeland and Erickson 1990; Kumpfer et al. 1996*a*). As found in prior SFP studies, these family programs encourage family members to increase family unity and cohesion, improve family communication, and reduce family conflict.

Program Purpose. Alone among parenting and family programs, SFP was developed specifically for children of drug-abusing parents. The key to reducing risk factors in children of substance abusers, the program developers believed, was to improve the family environment. Parents needed more ways to provide appropriate opportunities and to reward positive attitudes and responses in their children. Because families headed by drug abusers present many family relations problems, the program developers realized that making lasting changes would require more than a short parenting class. In addition, the program developers

were skeptical of the value of teaching discipline techniques to parents without opportunities to watch parents implement them. Program developers believed that allowing staff trainers to model appropriate responses to the child and coach the parent in better responses would be more productive. The developers of SFP also found that the children needed to learn improved prosocial skills.

Their intent was to design and test a family-based prevention intervention that would combine the following three separate 16-week classes into a single 16-week course with 2- to 3-hour weekly sessions:

- A parent training program
- A children's skills-training program
- A family skills-training program (parents and children participating together)

To achieve the development of such a family program, the following program activities had to be completed to make this a research-based program:

- The development of a causal model of both substance abuse in general and the generational transfer of these behaviors
- The collection and analysis of a needs assessment, baseline data on the types of families targeted to participate in the program to determine the most needed family components, and the appropriate program participant objectives
- The development, implementation, and evaluation of the three proposed prevention intervention programs mentioned above

PARTICIPANT GOALS AND OBJECTIVES: INTENDED ULTIMATE OUTCOMES

The original program goal was to reduce the substance abuse risk status of children (ages 6 through 10) living with a substance-abusing parent or parents. SFP is designed to reduce family environmental risk factors and improve protective factors with the ultimate objective of increasing personal resiliency to drug use in high-risk youth. Research suggests

that SFP is equally effective in reducing risk precursors for mental disorders and juvenile delinquency. Other family skills-training programs that are conceptually similar (i.e., McDonald's FAST Program, Bavolek's Nurturing Program, Boswell's Families in Focus, Catalano's Focus on Families, Bierman and colleagues' Fast Track program) have been used to reduce child behavior problems and child abuse.

The major objectives for SFP are the following for the family, the parents, and the children:

- Improve family relations
  - Decrease family conflict
  - Improve family communications
  - Increase parent-child time together
  - Increase family planning and organization

- Increase parenting skills
  - Increase positive attention and praise
  - Increase parent's empathy with child
  - Reduce physical punishment
  - Increase effective discipline
  - Decrease parent's use or modeling of drugs

- Increase children's skills
  - Increase communication skills
  - Increase peer refusal skills
  - Increase recognition of feelings
  - Increase knowledge of alcohol and other drugs
  - Increase coping skills for anger and criticism
  - Increase compliance
  - Decrease aggression and behavior problems
  - Increase self-esteem
  - Reduce future intentions and use of alcohol and other drugs

PROGRAM CONTENT

Both parents and children attend separate classes for the first hour and then work together in family sessions in the second hour. A third hour is spent in logistics, meals, and family fun activities. The underlying concept is to have the parents and children separately learn their skills or roles in a family activity and then come together to practice those family skills.

The Parent Training Program sessions in the original SFP included group building, teaching parents to increase wanted behaviors in children by increasing attention and reinforcements, behavioral goal statements, differential attention, chore charts and spinners (piecharts with sections representing rewards mutually decided on that children may get if they complete all chores and a spun arrow lands on it), communication training, alcohol and other drug education, problemsolving, compliance requests, principles of limit setting (timeouts, punishment, overcorrection), limit-setting practice, generalization and maintenance, and development and implementation of behavior programs for their children.

The Children's Skills Training Program included a rationale for the program; communication of group rules; understanding feelings; social skills of attending, communicating, and ignoring; good behavior; problemsolving; communication rules and practice; resisting peer pressure; questions and discussion about alcohol and other drugs; compliance with parental rules; understanding and handling emotions; sharing feelings and dealing with criticism; handling anger; and resources for help and review.

The Family Skills Training Program sessions provided additional information and a time for the families to practice (with trainer support and feedback) their skills in Child's Game (Forehand and McMahon 1981), a structured play therapy session with parents trained to interact with their children in a nonpunitive, noncontrolling, and positive way. Research and observation have shown that dysfunctional, antisocial, and drug-abusing parents are very limited in their ability to attend to their children's emotional and social cues and to respond appropriately (Hans 1995). Hence, the four sessions of Child's Game focused on training parents in therapeutic parent-child play. The next three sessions of Family Game meetings trained parents and children to improve family communication. Four sessions of Parents' Game focused on roleplays during which the parents practiced different types of requests and commands with their own children. The beginning session focused on group building, introduction to content of program, and contracting and brainstorming possible solutions to barriers to attendance. The 13th session focused on generalization of gains and connecting to other support services; the 14th session is a graduation celebration. A testing session before and after the program meant the families actually attended for 16 weeks; the training program is 14 weeks long.

Recruitment and Retention Strategies

To increase recruitment and retention, a number of incentives were developed by the various sites implementing the program as recommended by Kumpfer (1991), including meals and snacks, transportation, rewards for attendance and participation (drawing tickets or vouchers for sporting, cultural, educational, and social family activities; movies; dinners; groceries; clothing; household items; and children's Christmas gifts), a nursery for child care of younger siblings, older adolescent recreation, and support/tutoring groups for older siblings.

SFP RESEARCH RESULTS

SFP for elementary school-age (6 to 12 years old) children of substance abusers was originally tested under a NIDA grant in Salt Lake City, Utah, and based on promising positive results in this randomized subject Phase III intervention trial research. It was subsequently modified and evaluated in CSAP Phase IV defined population research studies with African American families in Alabama and Detroit, with multiethnic families in three counties in Utah, with Asian and Pacific Islander families in Hawaii, and with Hispanic families in Denver.

Original NIDA SFP Research

Development of SFP began in 1983 as a 4-year prevention research project funded by NIDA. The program was initially tested with outpatient clients participating in community mental health drug outpatient treatment and the methadone maintenance program. The actual family program was run at different community centers to avoid the stigma of drug abuse.

The original NIDA-funded research was designed to reduce vulnerability to drug abuse in children of substance abusers. The sample of 218 families consisted of 71 experimental intervention families, 47 no-treatment matched families, and 90 general-population comparison families. Employing an experimental dismantling design (PT-only, PT + CT, PT + CT + FT, no-treatment) families were randomly assigned to:

- Parent Training (PT), a 14-session SFP Parent Training Program based on Patterson's Parent Training model (Patterson 1975, 1976)

- Parent Training plus Children's Skills Training (PT + CT) based primarily on Spivack and Shur's (1979) social skills training

- Comprehensive Family Training Program (PT + CT + FT), a three-part combination of the prior two programs plus the SFP Family Skills Training Program based on Forehand and McMahon's program described in their book (Forehand and McMahon 1981) and Guerney's Family Relationship Enhancement Program

MEASUREMENT

Program Implementation Documentation: Process Evaluation

Highly intensive qualitative and quantitative program evaluation methods are used to track program fidelity and implementation. At the end of each family session, the four trainers log attendance for each participant, rate each family member on eight dimensions of participation and their Global Assessment Score for overall mental status, and complete a trainer session form on activities completed, any modifications made, and any critical events that occurred. Staff members are confidentially interviewed annually for recommendations on program implementation and program changes. The program is observed twice by two trained observers using fidelity checklists that track percent of structured activities completed as well as the quality of each leader's delivery of each major activity.

Outcome Evaluation

The hypothesized parent, child, and family outcomes are primarily measured using standardized measurement instruments. An extensive instrument battery was developed to measure hypothesized risk and protective factor outcomes, including the Child Behavior Checklist (CBCL) (Achenbach and Edelbrock 1988); the Parent Attitude Test (Cowen 1968), and the Family Environment Scale (FES) (Moos 1974). Analysis of the baseline pretest revealed that children of drug abusers in treatment have significantly more behavioral, academic, social, and emotional problems than matched comparison group children or general-population children (Kumpfer and DeMarsh 1985).

A major confounding variable is outside services to these families. To control for outside services received, the families and site coordinators

track the alternative services received. This procedure has been conducted only in the most recent research studies and is proposed for all future research studies.

Outcome Research Results

The outcome data suggest that by combining the parenting, children's skills-training, and family relationship enhancement programs, many more risk and protective factors for drug abuse were positively changed. The combined effect of all three components was the most powerful in improving the child's risk status in three theoretically indicated and intervention-targeted areas: (1) children's problem behaviors, emotional status, and prosocial skills; (2) parents' parenting skills; and (3) family environment and family functioning (improved family communication, clarity of family rules, nonconflictive sibling relationships, decreased family conflict, and social isolation).

The component outcome analysis suggests that each program component was most effective in impacting those risk or protective factors most directly targeted by that component. For instance, the behavioral parenting program improved the parents' ability to reduce negative, acting-out behaviors in their children and improve child compliance with parental requests. Unfortunately, the parent training program alone did not improve children's prosocial skills (i.e., communication, problemsolving, peer resistance, goal setting). These were significantly improved when the children's skills-training component was added. Family relationships actually deteriorated when the parent training program was implemented alone. The children reported at posttest that they did not believe their parents loved them as much as before the parenting program started. When the family relationship enhancement program was added, parent-child relationships improved significantly.

While the children's social skills increased with exposure to the Children's Skills Training Program in the PT + CT condition, the improvements in negative acting-out behaviors were not as good as that found for PT only. This result, plus similar results of Dishion and Andrews (1995), calls into question the potential value of high-risk, child-only groups because of possible negative contagion effects and smaller effects on improving youth risk behaviors. Having highly qualified and effective trainers who can manage groups of conduct-disordered children to maintain order and positive group norms would reduce this problem.

Hence, it appears that the Parent Training Program significantly improved parenting skills and parenting self-efficacy, the Children's Skills Training Program improved children's prosocial skills, and the Family Skills Training Program improved family relationships and environment. In addition, when all three classes were run simultaneously in a coordinated manner, the children's risk and protective factors for drug use improved, and the use of tobacco and alcohol decreased in the older children who were already using (DeMarsh and Kumpfer 1985; Kumpfer and DeMarsh 1985). Parents also reduced their drug use and improved in parenting efficacy (DeMarsh and Kumpfer 1985).

Five-Year Followup Study

SFP was implemented in three counties in Utah through a CSAP Community Youth Activity Program (CYAP) grant to the Utah State Division of Substance Abuse. Eight community agencies participated, including substance abuse prevention agencies that serve only ethnic populations, such as Asians, Pacific Islanders, and Hispanics. SFP was tested in employing a quasi-experimental pretest, posttest, and followup design comparing SFP with Communities Empowering Parents Program, a local variant of SFP with no family skills training component. The families (421 parents and 703 high-risk youth ages 6 to 13) were recruited to attend one of the two programs. On the pretest, 57 percent of the youth had behavioral and academic problems. The total sample included 33 percent fathers, 59 percent mothers, and 8 percent guardians or foster parents from 49 percent single-parent families, 66 percent low-income families, 69 percent ethnic families (26 percent Asian, 20 percent Pacific Islander, 18 percent Latino, and 5 percent Native American youth), and 50 percent of families with little or no religious involvement. The program materials for both programs and instrument battery for this project were translated into Spanish, Vietnamese, Tongan, Korean, and Chinese. Rates of attendance and completion for the program were very high, averaging 85 percent across the three county sites.

Immediate posttest results indicated that SFP was more effective overall in improving the family environment, parenting behaviors, and the children's behaviors and emotional status. Significant pretest/posttest reductions in the youths' problems were reported by the SFP parents on all CBCL subscales and composite externalizing and internalizing scales. Two of the Moos FES scales for family conflict and cohesion showed

significant improvements. SFP was significantly more effective than the comparison program.

A 5-year followup study of just the SFP participants (Harrison and Proschauer 1996) included 87 families confidentially interviewed by a research psychiatrist from Harvard University. The results, shown in figure 1, provide evidence of long-term positive impact on the family and the child.

These interview data suggest that the parents reported very high mastery of the behavioral and social parenting skills taught in the parenting and family components of SFP. Almost all said they were rewarding good behavior frequently, were giving clear directions, were using reasonable consequences and timeouts, and had improved their problemsolving with their children. Consequently, most reported improvements in the quality of time they spent with their children and said family members enjoyed each other more. All but 15 percent said they scheduled family playtime regularly. While it may be easy for parents to deceive themselves on these measures of parenting and family relationships, it is more difficult to misjudge the frequency of a concrete behavior such as family meetings. Family meetings were reported being conducted by 68 percent of the families at least once per month, and 37 percent conducted them weekly. The adults reported lasting improvements in family problems (78 percent), stress/conflict levels (75 percent), amount of family fun (62 percent), family talking together more (67 percent), and showing positive feelings (65 percent). Analyses revealed a gradual decline in the frequency of use of family skills taught in the program; however, the researchers (Harrison 1994) concluded "the change figures show that a majority of families maintain lasting improvements, even over a 5-year period."

CULTURAL REVISIONS

Since its initial inception as a generic program for white and multiethnic drug-abusing parents and their children, SFP has been made more culturally sensitive for specific ethnic populations in Phase IV defined population research studies (Jansen et al. 1996). These cultural modifications have been made through a series of independent CSAP Federal grants to State and community agencies targeting specific low-socioeconomic, high-risk ethnic populations of drug-abusing parents (i.e., rural African Americans [Alabama], urban African Americans

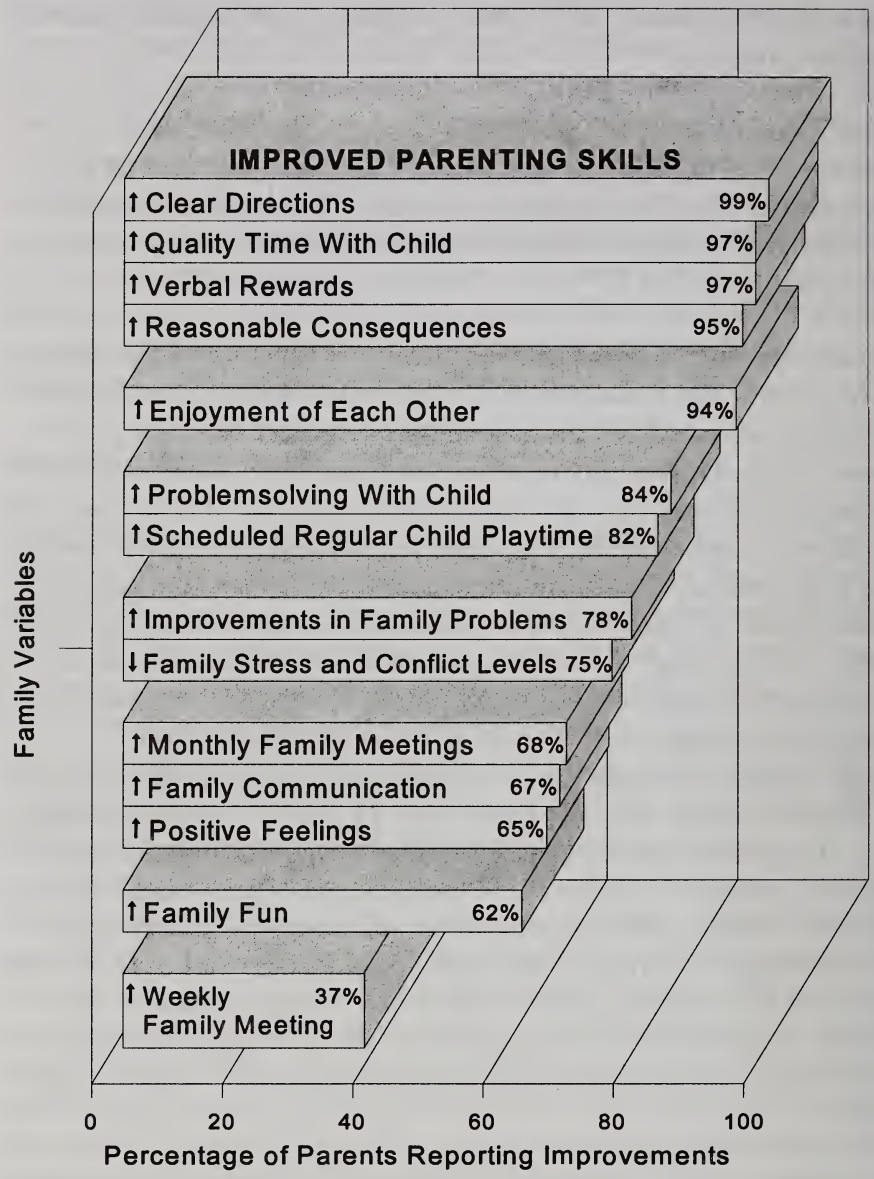

FIGURE 1. *Utah State Division of Substance Abuse CYAP Strengthening Families Program 5-year followup study.*

SOURCE: Harrison and Proschauer (1995)

[Detroit], urban [Utah] and rural [Hawaii] Asians and Pacific Islanders, and urban Hispanics [Salt Lake City and Denver]). Each of these program modifications and replications involved independent evaluators. In each case, most of the positive results of the original family program, with minor variations, have been replicated. Each replication has lent additional support for the effectiveness of SFP. The replications with the weakest results (Denver and Hawaii) are attempts to generalize the program to families with non-drug-abusing parents. In addition, the cultural modifications of these programs are substantial, and the basic principles or essential core elements (Kumpfer 1996) needed for success have possibly been compromised.

School-Based SFP

The first independent implementation and revision of SFP was by Joel Millard and Sally Brown of Project Reality, a methadone treatment center in Salt Lake City. Their goal was to create a school-based SFP that used teachers paired with parents as trainers. Because of the problems with logistics, they did not implement the family skills-training components. The new program was called Teachers Helping Parents (later renamed Communities Empowering Parents Program). A doctoral dissertation suggested that the results were positive (Millard 1988), and the program is being implemented in many local schools in Salt Lake City. Further revisions of this SFP version were made for Asian, Pacific Islander, and Hispanic families at the Asian Association of Utah and the Centro de la Familia. Language translations of the testing instruments were available.

Rural African American Families Study

Revisions were made to SFP to make it more appropriate for rural African American families by Dan Hoke, Lynne Brown, and Pinky Platt at the Cahaba Mental Health Center in Selma, Alabama. New manuals were developed by the African American trainers, with illustrations done by an African American cartoonist. This version is not very different from the original SFP, except for some additional readings on famous African Americans and quotes from African American professionals. The process evaluation revealed that the program was exceptionally well implemented, possibly because of the commitment and professional skill level of the African American trainers involved. Recruitment became a major barrier in this program after the first year when all the substance-abusing African American women in outpatient treatment at the mental

health program had already participated in the program. At this point a special indigenous recruiter was hired to locate and recruit substance-abusing women who were not in treatment. Women were recruited from public housing, churches, classes for special education children with behavioral or academic problems, and other sources.

Rural African American SFP Results

The Alabama SFP compared low-drug-use families (alcohol use only) with high-drug-use families (alcohol plus illicit drug use) in a quasi-experimental pretest, posttest, and 1-year followup design involving 62 families. Most (82 percent) of the recruited families completed at least 12 of the 14 sessions. Results showed that high-drug-use mothers not in drug treatment reduced their drug use on a composite index of 30-day alcohol and other drug quantity and frequency of use, family conflict decreased, and family organization increased. Before the program began, the children of the high-drug-use mothers compared with children of low-drug-use mothers had significantly more (CBCL) internalizing behavior problems (depression, obsessive-compulsive behavior, somatic complaints, social withdrawal, uncommunicative behavior, and schizoid scales) and externalizing behavior problems (aggression, delinquency, and hyperactivity).

As shown in figures 2a, 2b, and 2c, analyses of variance (ANOVAs) revealed significant pretest to posttest interaction effects between the two groups. The children of the high-drug-use mothers who participated in the program improved significantly in almost all CBCL scales when tested with paired *t*-tests.

By the end of the program, the children of high-drug-use mothers were rated as significantly improved on both internalizing and externalizing scales and all subscales, except the uncommunicative subscale. Children of low-drug-use mothers improved only on the clinical scales for which they manifested relatively higher scores on the intake pretest, namely obsessive-compulsive behavior, aggression, and delinquency. Because of the relatively low subject numbers in these analyses, these results are also clinically significant, and the effect sizes are very large. Some additional results of interest were that the program outcomes of improved parenting behavior and children's behavior were equally as effective with low-education-level women (less than high school graduation) as those of participants with more than a high school education. Of most interest was that the women who were not in

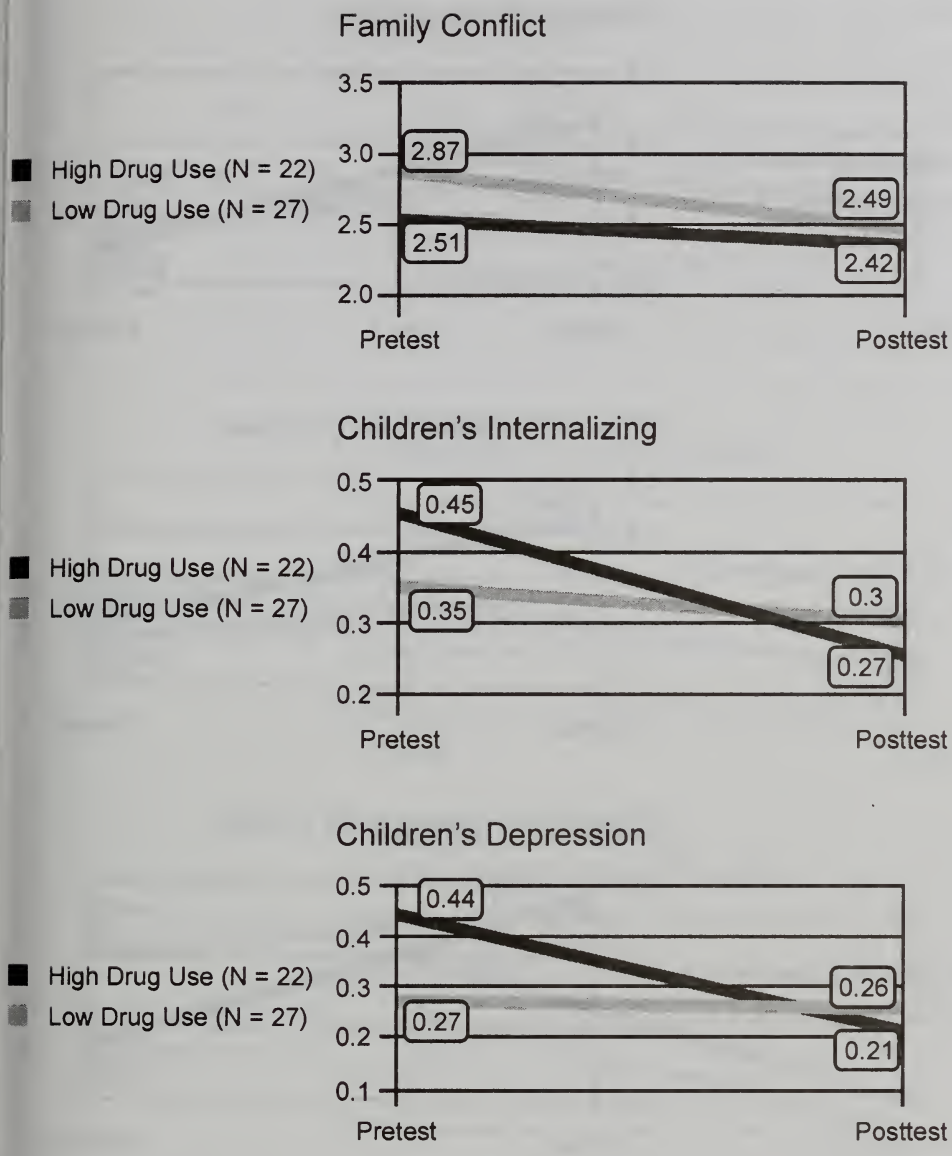

FIGURE 2a. *Analysis of variance comparing pretest and posttest results for Alabama Strengthening Families Program participants. A large decrease in family conflict and children's internalizing and depression for high-drug-use families and a smaller decrease for low-drug-use families are shown.*

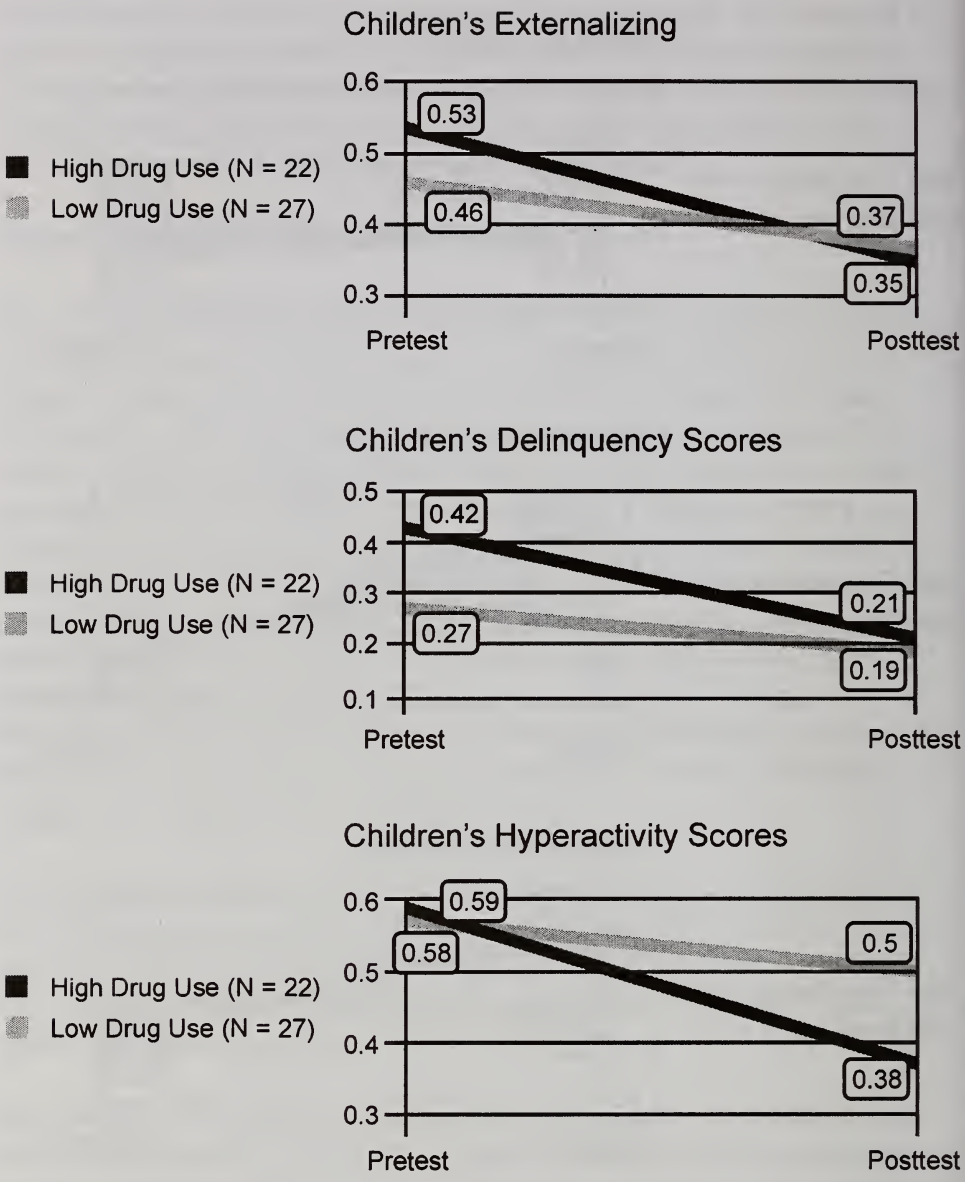

FIGURE 2b. *Analysis of variance comparing pretest and posttest results for Alabama Strengthening Families Program participants. Significant reductions in scores on children's externalizing, delinquency, and hyperactivity scales for both high-drug-use and low-drug-use families are shown.*

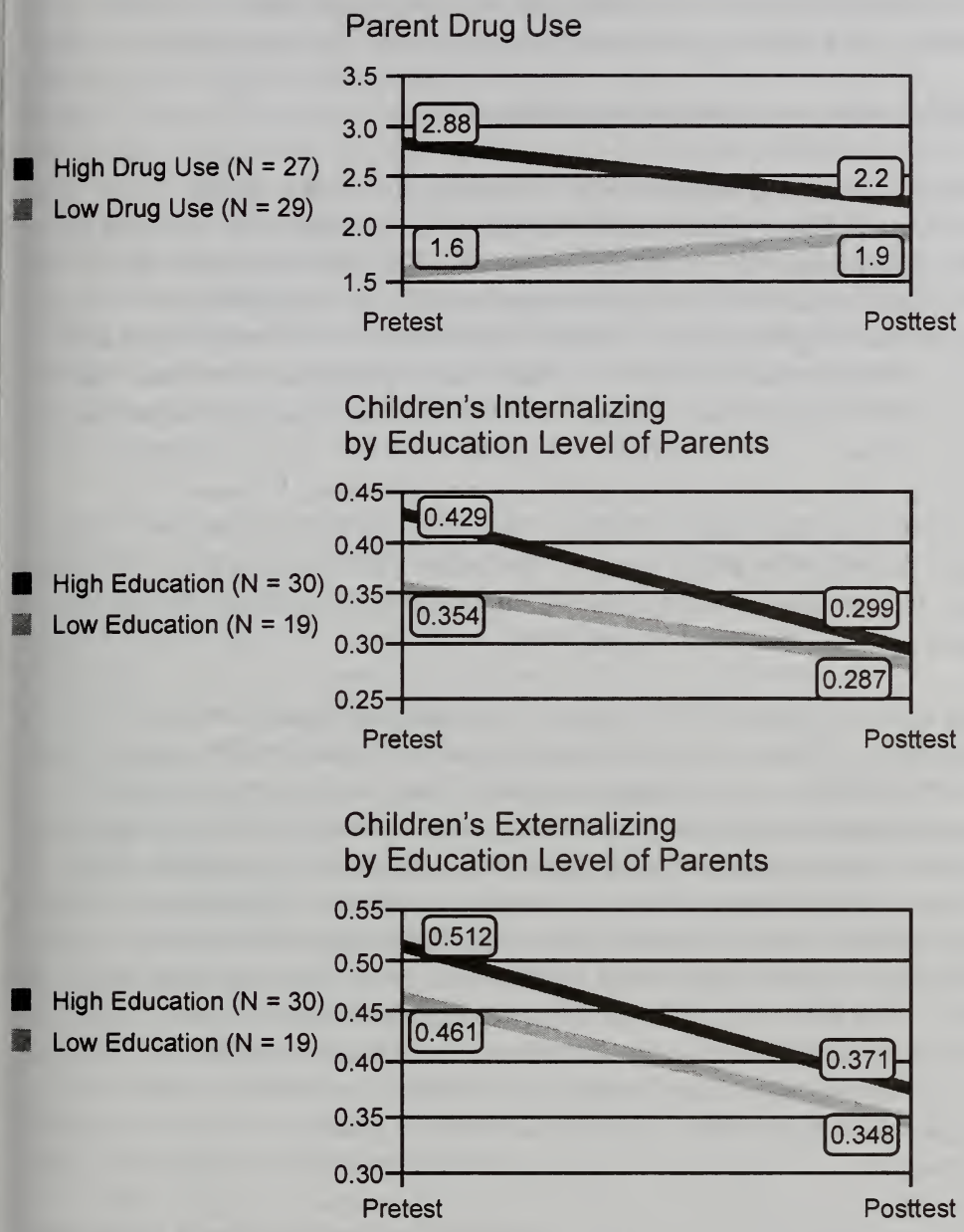

FIGURE 2c. *Analysis of variance comparing pretest and posttest results for Alabama Strengthening Families Program participants. The first graph shows a significant decrease in drug use for high-drug-use families; the next two graphs show significant decreases in children's internalizing and externalizing behaviors for all parental education levels.*

treatment for substance abuse significantly decreased their composite alcohol and illicit drug use index by posttest and first-year followup.

Urban African American Families

Georgia Aktan and Susan Bridges from the Detroit City Health Department and the Harborlight Salvation Army in Detroit developed a 12-session culturally competent version of SFP, called the Safe Haven Program, for inner-city African American drug-abusing parents in residential drug treatment programs. (The manuals are revised from the rural African American version.) Because the parents are recruited from drug treatment agencies, discussion of the effects of substance abuse on their children was moved from the eighth session to the first session. The Safe Haven Program included its own videotapes, because their African American families did not want to see parenting tapes that involved any other ethnic groups. They also wanted videos that reflected their local reality of high-crime and high-drug-use neighborhoods with many safety concerns for the children.

The research results of this program essentially replicated the prior Alabama and Utah results and were reported in more detail by Aktan (1995) and Aktan and colleagues (1996). The reasons for successful implementation of the program, as discussed by Aktan (1995), included careful selection, training, and supervision of the staff. Within the first 2 years, 88 low-income African American families completed the program; 68 of these families had incomes below the poverty level. Although only about half of all families completed the program the first time it was delivered, once the trainers had more experience, the retention rate rapidly rose to 80 percent, where it remained for the 4 years of implementation. Child care, meals, transportation, and support with basic needs (groceries and clothing) helped to improve recruitment and retention. A high percentage of fathers in drug treatment were recruited by a male African American counselor. The program became so popular that 25 to 50 families were on the waiting list at any one time.

Outcome results from a nonequivalent comparison, repeated measure, quasi-experimental design reported in more detail by Aktan and colleagues (1996) showed significantly improved family, parenting, and child behavior using ANOVA with independent *t*-tests of correlated means comparing matched subjects (N = 56) with experimental families (N = 88). No unintended negative effects were found; hence, the Safe

Haven Program appears to be a beneficial adjunct to drug treatment and supports the drug treatment process. A covariate analysis found that high-drug-use families improved significantly more than low-drug-use families. Most importantly, highly significant decreases were reported in both family and parental illicit drug use ($p < 0.002$ and $p < 0.000$) and in parent depression ($p < 0.02$). While family environment as measured by the FES (Moos 1974) improved for family relationships ($p < 0.07$), family organization ($p < 0.056$), and reduced family conflict ($p < 0.06$), only the family cohesion variable met statistical significance ($p < 0.03$) because of low power from a small sample size. This increase in family cohesion (not found in Alabama) may have occurred because the Safe Haven Program put more emphasis on reuniting the mothers and fathers as a total family.

The families reported spending more time together and increasing parent and child activities ($p < 0.004$ for both variables). Parents reported nonsignificant trends in decreased use of corporal punishment and inappropriately high developmental expectations and reported statistically significant increased perceived efficacy as parents ($p < 0.002$). According to parental reports on the CBCL, children's externalizing problem behaviors decreased significantly overall ($p < 0.006$) as a composite of improvements in aggression ($p < 0.006$), hyperactivity ($p < 0.003$), and conduct disorders or delinquent behaviors ($p < 0.08$). The overall composite internalizing scale suggests significant reductions ($p < 0.027$), which was not as strong as the externalizing results, because all subscales (depression, uncommunicative behavior, obsessive/compulsive behavior, and schizoid tendencies) showed significant improvements except for somatic complaints ($p < 0.73$). Parents reported highly significant improvements in school bonding ($p < 0.001$) and increased children's time spent on homework ($p < 0.03$). These parent reports matched therapists' reports on behavioral improvements in participating families.

Asian and Pacific Islander Families

In Hawaii, the Coalition for Drug-Free Hawaii, headed by Sandra Lecar, has revised SFP to be more culturally appropriate for Hawaiian Asian and Pacific Islander cultures. The Strengthening Hawaii Families (SHF) program has a 20-session curriculum that emphasizes awareness of family values, family relationships, and communication skills. A 10-session family and parenting values curriculum precedes the

10-session SFP family management curriculum to increase parental readiness for change. The revised curriculum covers topics such as connecting with one another, caring words, generational continuity, culture, communication, honesty, choice, trust, anger, problemsolving, decisionmaking, and stress management. An audiotape and videotape accompany the new curriculum manuals. The program, originally implemented and evaluated under a CSAP grant, is being widely disseminated primarily through schools in Hawaii with funding from a number of local foundations, trusts, and the Hawaii Children's Trust Fund. In 1996, 79 individuals from 22 agencies on Kauai, Maui, and Oahu were trained to facilitate SHF in their communities. A Systems Implementation Committee was formed in 1995 that included representatives from the legislature, government, schools, community services agencies, health departments, health maintenance organizations, and volunteer organizations. The goal is to implement SFP throughout schools, churches, and service organizations statewide.

An independent evaluation was conducted by the University of Hawaii (Kameoka 1996) using a quasi-experimental, pretest-posttest, nonequivalent control group design to evaluate the effectiveness of hypothesized outcome variables to program objectives. Despite having selection criteria (e.g., risk factors, ethnicity, socioeconomic status), the no-treatment group was not matched for risk factors to the experimental group. Hence, comparability between the groups was not achieved, and the treatment group included more high-risk subjects. The control group was recruited separately, and the staff experienced difficulties recruiting families for a no-treatment comparison group. In addition, the original 14-session SFP implemented in four sites in fall 1992 was compared with the 20-session, culturally revised SHF program implemented in nine sites between spring 1994 and winter 1995. Parents were tested in groups in the first and last parenting sessions and were paid $20 each time they completed the questionnaire.

Over the 3 years, 136 participants began and 71 completed the program and the posttest. Hence, attrition from the experimental group was high over all 3 years (48 percent) and did not improve significantly with the development of the culturally revised programs (51 percent dropped out of SFP and 45 percent and 48 percent from the culturally revised SHF). Dropout tended to be a function of experience of the trainers and numbers recruited initially. The higher the number initially recruited, the greater the dropout because the program works best with about 6 to 8 participants, especially with the large Pacific Islander family sizes. For

instance, the very first group pretested 18 families, but ended with a more appropriate number of 5 families. The resulting high (72 percent) dropout rate for this group only possibly occurred because the trainers did not really attempt to retain such high numbers. One group in the second year, however, did begin with 10 families and had none drop out, possibly because of excellent facilities and trainers. A dropout analysis suggested that families more likely to complete the program included those most in need (e.g., most economically disadvantaged, homeless, greater family substance use, and greater children's emotional problem severity). Dropout rates also varied by ethnic group, with statistically significant increases for Filipinos and Samoans compared with Hawaiians or part-Hawaiians. Only 21 percent of the 96 participants in the comparison group failed to complete the posttest; hence, 76 comparison participants were included in the data analysis. The SFP attendance criterion of completers being required to attend at least 12 sessions was not applied to SHF, and the average number of sessions attended was 9 (4 to 14 sessions).

The measurement battery was culturally modified by altering words and expressions not common in Hawaii and included several different tests including the 53-item Brief Symptom Inventory (BSI) (Derogatis and Lazarus 1994) and the Center for Epidemiological Studies Depression Scale (CESD) (Radloff 1977) rather than the Beck Depression Inventory (BDI) (Beck et al. 1961). Only the 113-item Teacher's Report Form (TRF) (Achenbach and Edelbrock 1991) was used rather than the parent CBCL version. Teachers were paid $5 to complete and return the form in a stamped manila envelope. The same 49-item substance use measure (Kumpfer 1981) was used as the original SFP testing battery as well as the four 10-item subscales of the FES (Moos 1974) on cohesion, expressiveness, conflict, and organization and two subscales of the Adult-Adolescent Parenting Inventory (AAPI) (Bavolek 1985) on physical punishment and inappropriate expectations. A third subscale on parent's use of positive reinforcers was developed by the evaluator (Kameoka 1996).

Because of high (48 percent) attrition, low attendance rates, and lack of risk-level equivalence of the experimental and comparison groups, the results of the outcome evaluation must be interpreted with caution. Small sample sizes (Ss) (19 Ss completed SFP and 52 Ss completed SHF), reduced risk at pretest compared with drug treatment samples in other studies, and switching to a values-based curriculum versus a social learning theory-based family and social skills training curriculum all

contributed to lower power and effectiveness. This program was interpreted by the evaluator as an "educational program designed for nonclinical populations"; hence, participants receiving professional services were eliminated from the data analysis, yet they may have benefited the most (Kameoka 1996).

Outcome Evaluation Results

Because of the nonequivalence of the comparison and experimental groups, only the significant pretest and posttest changes are reported here. Both the SFP and SHF programs attained their goal of strengthening family relationships and resulted in significant improvements in family conflict, family cohesion, and family organization. No significant improvement was reported for expressiveness or communication, possibly because of the low alpha reliability ($\alpha = 0.44$). Only the original SFP resulted in statistically significant improvements ($p < 0.05$) in attitudes and skills in rewarding positive behaviors. The largest mean improvement for physical punishment was for the original SFP, but because of low numbers and high variance, this positive result can be reported only as a nonsignificant trend. Similarly, the original SFP appeared to be more effective in reducing parental depression (mean = 14.95 to 10.95) compared with the culturally modified SHF (mean = 15.69 to 13.67) on the Depressed Mood Scale; however, because of a larger sample size, only SHF produced a statistically significant result ($p < 0.05$). Even with a smaller sample size, SFP was more effective in positively impacting the various scales of the BSI with statistically positive changes in somatization, interpersonal problems, anxiety, hostility, phobias, and paranoia, whereas the SHF program impacted only hostility and paranoia in addition to depression. The BSI depression scale, similar to the Depressed Mood Scale, did not meet statistical significance for the original SFP, although the mean decrease was bigger than for the SHF program, which had a significant decrease in depression.

Substance use decreased in SFP participants for parent, sibling (mean = 0.50 to 0.14), and child use (mean = 0.82 to 0.12) but increased significantly for SHF in child use (mean = 0.14 to 0.89, $p < 0.05$) and nonsignificantly for parent use (mean = 0.83 to 1.20). Although part of the standard SFP testing battery, the CBCLs were not collected for the SFP program by the Hawaiian evaluator. The Teacher's Report Form CBCLs were added the year SHF was implemented. Despite high alpha reliability scores ($\alpha = 0.93$ internalizing scale and $\alpha = 0.96$ externalizing

scale), no significant improvements were found in children's behaviors as rated by their teachers from pretest to posttest. No followup results were collected, though they were included in the original evaluation plan developed by Kumpfer; hence, improvements or detriments over time were not measured.

Hispanic Families

The Denver Area Youth Services (DAYS), under the direction of Project Director Bob Pacheco, has been involved in modifying the SFP for increased local effectiveness with primarily Hispanic children and families in several inner-city housing projects. These are the families shown in the NIDA videotape "Coming Together On Prevention" (National Institute on Drug Abuse 1994). While this 5-year CSAP high-risk youth grant has not yet been completed, the preliminary results suggest that the staff has been successful in attracting and maintaining these high-risk families in SFP. Between September 1992 and February 1996, SFP and a child-only Basic Prevention Program (BPP) comparison intervention had been implemented with 311 clients. Twenty-five percent of referrals came from schools and other community agencies, but the balance of 75 percent came from DAYS' own aggressive outreach efforts in housing complexes.

One of the major successes of this program was the very high program completion rate of 92 percent, based on the criteria of participants attending at least 70 percent of all sessions and participating in the graduation ceremony to receive a certificate of completion (Kumpfer et al. 1996*a*). The mean age of the children was 8.43 years (range 5 to 12 years). Fifty-three percent were boys, and 47 percent were girls. Seventy-five percent of the children came from single-parent homes, with 30 percent of the mothers reporting that they were never married to the biological father. The mean family income was $6,700, so most participants were from low-income families. The manuals were substantially modified, with Spanish translation versions for Spanish-language families.

The Strengthening Hispanic Families program is being evaluated by Wamberg and Nyholm (1994). Careful attention to retention in the followup design has resulted in 87 percent of the families completing the 6-month followup and 75 percent completing the 1-year followup. A relatively low level of risk factors was found in these children, possibly because this program was not selecting for children of

substance abusers like the original NIDA research or the Utah, Alabama, and Detroit studies. On a referral rating scale and a risk factor rating scale consisting of six major risk factors, only 15 to 25 percent of the children had low to moderate adjustment problems in areas of school adjustment, family disruption, negative peer involvement, mental health problems, and deviant behavior. These preliminary intake assessment results suggest that using ethnicity and low income as the criteria for a selective family-based drug prevention program is probably not sufficient in targeting high-risk children. Because of the low level of risk factors reported in these participating children, it will be much more difficult to have a significant positive impact on these children because of a ceiling effect. Of course, it was possible that the families were significantly underreporting their risk levels because of lack of trust in the confidentiality of their answers. A retrospective posttest would be helpful in determining whether underreporting occurred at intake.

The primary measures used to measure program effects included the Client Self-Report Assessment Scale (CSRAS) (Wamberg and Nyholm 1994), a child self-report instrument administered as an interview, and the Parent Assessment Profile (PAP), consisting primarily of the CBCL (Achenbach and Edelbrock 1991) and the FES (Moos 1974). Because of the low level of actual drug use in elementary school students, a novel drug exposure scale was constructed to measure hypothesized reductions in drug exposure. Baseline data suggest that the major increase in exposure to tobacco, alcohol, and other drugs occurs in these Hispanic children between ages 8 and 9. As in the Utah studies, many of the children (33 percent) report being sad or depressed, with 28 percent saying they have thoughts of hurting themselves or committing suicide. As many as 20 percent of these elementary school children have had difficulties with school adjustment, and 44 percent have been involved in fights.

The internal consistency reliabilities (Chronbach's alphas) for all pretest measures are relatively high: 0.85 to 0.94 for the referral and intake scales, 0.60 to 0.94 for the children's CSRAS scales, and 0.53 to 0.92 for the parents' PAP scales. Getting equally high or higher reliability scores for such young children demonstrated that by using optimal interview methods, even children as young as age 5 can produce reliable data. The Moos FES scales ranged from 0.62 to 0.75 in alpha coefficients on the pretest but increased from 0.77 to 0.90 on the first posttest. The CBCL scales ranged from 0.78 to 0.90 on the pretest and decreased slightly on the posttest from 0.74 to 0.85. The lowest alpha reliability on the PAP

was for family drug use (0.53 alpha), and the highest was for child drug use (0.92 alpha). The lowest alpha reliability on the child interview measure (CSRAS) was for peer influence (0.60), and the highest was for program goals and expectations (0.94). In reviewing these data, it appears that higher reliabilities are found for both parents and children when they are asked about positive factors rather than negative behaviors or about someone else's behavior or drug use. This result may suggest that evaluations from a personal or family strengths perspective may yield more reliable data. Family strengths measures have been developed by Dunst and associates (Dunst and Trivette 1994; Kumpfer 1996) with their new Family Strengths Assessment instrument.

Child and parent satisfaction and perceptions of usefulness of the two comparison programs were almost identical, although parents rated SFP slightly higher, except in the areas of child "doing better at school" and child "making friends," for which parents rated SFP about 20 percent higher (65 percent versus 46 percent). Children who participated in each program rated both programs about the same in usefulness.

Because of significant baseline differences between the ratings of the children in the child-only comparison intervention (BPP) with those in SFP, the repeated measures outcome data (pretest, posttest, and 6-month followup) will include analyses of variance (ANOVAs) or covariance (ANCOVAs) to determine changes across time within groups. The final outcome results should be available in about a year.

RURAL FAMILIES OF JUNIOR HIGH SCHOOL YOUTH

In conjunction with Program Originator Karol Kumpfer, researchers at Iowa State University developed a seven-session modification of SFP for junior high school students based on resiliency principles (Kumpfer, in press-*a*) called the Iowa Strengthening Families Program (ISFP) (Molgaard and Kumpfer 1994). Research on this program was conducted with NIDA and NIMH funding for a Phase III experimental intervention trial (Greenwald and Cullen 1985; Jansen et al. 1996), which compared 33 randomly assigned schools from 19 contiguous rural counties with either ISFP, Preparing for the Drug-Free Years (PDFY) (Hawkins et al. 1994), or no-treatment control schools. Like the original SFP, ISFP included parenting and youth sessions in the first hour and a family session in the second hour. Parents were taught the importance of encouraging and supporting dreams and goals or resilience in their

children, appropriate expectations and discipline, effective communication with preteens, handling strong teen emotions, and implementing family meetings to improve family togetherness, improve family organization and planning, and determine family rules and consequences for breaking family rules. The children's sessions generally paralleled the parent sessions and covered resilience with dreams and goals, stress and anger management, and social skills (e.g., communication, problemsolving, decisionmaking, and peer refusal skills). The family sessions engaged the participants in activities to increase awareness of youth and family goals, increase family cohesion and communication, and reduce family conflict.

ISFP was implemented in winter 1994 with 161 families from 21 ISFP groups from 11 schools, but only 114 families completed the pretest and were included in the data analysis. (The implementation and 3-day training of trainers for this program is discussed in detail in Kumpfer and colleagues [1996*a*]). The average group size was 8 families and ranged from 3 to 15 families with about 20 parents and children attending each session. Approximately 94 percent of pretested participants completed at least five or more sessions, 88 percent attended at least six sessions, and 62 percent attended all seven sessions. Despite the availability of the total parenting program on videotape to help standardize the implementation as well as reduce the cost of the second trainer, fidelity observations of at least two sessions showed that 83 percent of the content of the parent training session was covered in comparison with 87 percent of the family session and 89 percent of the youth skills training session. (Spoth and colleagues [1998] report in more detail on the recruitment and retention rates for Project Family containing ISFP and PDFY.)

Data were collected during 2- to 2½-hour inhome sessions using both questionnaires, including a number of standardized measures and three 15-minute videotaped tasks. The topics for the tasks included general questions about family life (e.g., approaches to parenting and household chores), which were discussed independently with either the mother and the child or the father and the child selected randomly and then switched. In a second task, the family members discussed sources of disagreement determined previously by a checklist. The families were paid $10 per hour for the testing time.

ISFP Results

The preliminary session-by-session results were analyzed to determine the immediate behavioral intentions to change compared with actual changes (see Bry and colleagues, this volume, for additional discussion on these data). Overall, the data suggested a number of significant behavioral changes in the mothers and fathers from session to session that matched the actual objectives of the sessions. There were differential effects on mothers and fathers, primarily related to differences in baseline behaviors. Hence, fathers and mothers appeared to change in those behaviors where they had more room for improvement.

The preliminary outcome data from the inhome video coding of family interaction patterns and the self-reported changes on the annual family assessments have shown significant improvements. While the comparisons of each of the measurement scales have not been reported yet, Spoth and colleagues (1998) reported significant pretest and posttest improvements in all hypothesized effects for both ISFP and PDFY employing a "group code approach" for small-sample structural equation models discussed in Aiken and associates (1994). This approach used a common measurement model for both the experimental and control groups and included a group-code variable (e.g., dummy variable with group type identified by either a "1" or "0"). The major advantage of this type of SEM is that half as many parameters are required compared with the multigroup approach, making this analysis attractive for smaller sample sizes relative to the number of parameters estimated. A finding of no statistically significant intraclass correlations associated with outcome measures indicated that family-level rather than school-level analyses would be appropriate despite the nested research design of families within randomly assigned schools. Spoth (this volume) reports more on the preliminary results; however, at this point it appears that the three hypothesized structural effects (parent-child affective quality, intervention-targeted behaviors, and general child management) were statistically significant at both pretest and posttest at the 0.01 level conducting an SEM analysis employing 178 ISFP and 179 control-group families (N = 357).

Overall Summary of Multiple SFP and ISFP Study Results

Only two of these SFP research studies involved true experimental designs with random assignment to experimental groups—the original

NIDA SFP study and the NIDA/NIH ISFP study. The results from the CSAP SFP replications should be interpreted with caution, because they are based on quasi-experimental studies. The repeated replications with external evaluators, however, suggested that SFP can be implemented by others with integrity and fidelity. This is partially because the SFP manuals and training of trainers materials are very specific and detailed. The SFP trainings require staff members who will be doing the training from the manuals to actually prepare several sessions and deliver them to the group who roleplay typical parents or children. Time is spent in processing group dynamics and in determining how to most effectively deal with participant issues that could arise from the program session content. Therefore, the trainers learn the total content of the program, see many different delivery styles, and learn how to deal with group dynamics. The outcome results suggested that SFP was robust in disseminations and consistently demonstrated positive findings concerning improvements in family-focused risk and protective factors or processes and children's behaviors on standardized measures. Because of these positive results, NIDA chose SFP as one of three substance abuse prevention programs for dissemination through a technology transfer initiative on prevention.

PROBLEMS IN IMPLEMENTING SELECTIVE PREVENTION RESEARCH

Recruitment and Retention Issues

Typical issues included subject recruitment and retention. (Ideas for overcoming barriers to recruitment and maintenance are discussed in more detail in Kumpfer [1991]). By employing many ways to attract and retain high-risk families, these problems have not been an issue since the first NIDA research grant and Alabama replication grant, which ran out of substance-abusing women in treatment after the first year and had to become more creative in identifying drug-abusing women living in the community and hire a halftime indigenous recruiter. In most SFP replications, a number of incentives are provided for participation. Meals are provided at the conclusion of the family sessions. All the children participate or are in child care (older teens can help with child care or participate in specially structured groups). Vans pick up the families and bring them to the community center or church for the program. Basic needs are provided for in some sites, with clothing and food baskets given at the conclusion of the program. Graduation is a

special dinner party, often at a special hotel with guest speakers who are key community leaders. Families are paid for completion of 12 of the 14 sessions and receive gift certificates redeemable at a local department store, often to buy Christmas toys or clothing for the children. To increase recruitment, parents are encouraged to invite to the graduation party other parents who could benefit from the program.

Cost Issues

The major implementation barrier for this program was helping the agencies understand the high personnel cost of this program. Because three interventions were run simultaneously, the program was most effectively implemented with four trainers plus two van drivers and at least one person for child care. In addition, the recommended incentives (discussed above) make the program more expensive. Staffing appeared to work best if staff members were paid overtime or hired as outside consultants to run the program because it was generally run in the evenings. The program trainer's manuals were very inexpensive ($40 each for six manuals) as well as the 3-day training ($2,000 plus travel expenses). Under the research grants, the author conducted all staff training.

Some program administrators found it difficult to understand why this program cost more. The reason was because there were three programs (a parent, child, and family skills training), not just one parenting class. Including the 3-day training costs ($2,000) and costs for the original six manuals ($250), the program could be implemented initially for as little as $4,450: Estimated personnel costs were $1,950 for four staff members for 16 weeks. Additional costs would accrue depending on the level of family incentives (child care, transportation, meals, completion bonuses) and staff supervision needed to make the program successful with the particular target population. Assuming about 4.5 family members attending (1.4 parents, 2 young children, and 1 adolescent) or 36 participants, the unit cost is $3.33 per hour of service or $53.33 per SFP participant. A cost-benefit or cost-effectiveness analysis has never been conducted, but it has been proposed in a future NIDA grant involving more than 800 African American and Anglo American families in the Washington, DC, metropolitan area.

Random Assignment to No-Treatment Issue

Another research issue was the random assignment of children from high-risk families to a no-treatment control group. Many community service agencies will not allow this unless they are convinced that the children in these families are only "high-risk" children and are not being referred because the children are diagnosed with mental health problems and need treatment. The identified parents should be given the drug or mental health treatment generally provided by the agency for their diagnosed problems. Additionally, if some children recruited are found to have diagnosed mental health or drug abuse problems, they should be treated or referred for treatment. Hence, no standard treatment is withheld, and only additional selective prevention services not generally provided are offered to the high-risk children.

SPECIFIC RESEARCH QUESTIONS/ISSUES FOR NIDA

Unfortunately, most selective family-focused prevention interventions have been evaluated using "black box," single-variable (program or no program/comparison program) evaluation designs, not research designs that manipulate independent variables within the program to allow more research questions to be answered about the programs. For example, there are many questions about parametric variations within family programs, such as length of the intervention, differential effectiveness for different types of families (i.e., single, divorced, ethnic, low or middle/high income, educational level, depression or drug use levels, and single-component versus multicomponent program effectiveness). Basically, there are many questions left unanswered by program evaluations that do not manipulate the independent variable in such a way as to answer more questions than whether the total program was effective compared with a control group. Additional posthoc statistical analyses (Cook and Campbell 1979) can be used to address some of the issues regarding effectiveness for subpopulations when recruiting different populations is difficult or burdensome for the site staff.

SUMMARY

Because of the consistent replications of positive findings in reducing risk factors across many different cultural groups for drug use in high-risk children of substance abusers, SFP has shown itself to be a very

powerful family intervention program. While only two NIDA randomized experimental Phase III intervention trials have been conducted (one for SFP and one for ISFP), the six Phase IV special population studies employing quasi-experimental replication designs and posthoc statistical designs (Campbell and Stanley 1963) provide additional support for SFP effectiveness. The effect sizes are reasonably, statistically significantly larger for higher risk families compared with lower risk families. Because of these positive results, NIDA chose SFP as one of three substance abuse prevention programs for dissemination through its technology transfer package on Prevention (National Institute on Drug Abuse 1994). This package includes the videotape "Coming Together on Prevention" of the Denver Strengthening Hispanic Families Program implemented by the Denver Area Youth Services agency and the technology transfer package *Selective Prevention for Children of Substance-Abusing Parents: The Strengthening Families Program Research Manual*, which describes SFP and includes a guide for implementation (Kumpfer et al., in press-*b*).

NOTE

1. This new seven-session SFP for junior high school students was created by Virginia Molgaard and Karol Kumpfer, with support from an NIMH research grant. Because the results of the clinical trials in 20 counties in Iowa are still being analyzed for effectiveness, the new program will not be included in this resource manual. Prevention practitioners interested in a selective prevention intervention based on resiliency research can read a description of the program by Kumpfer and colleagues (1996*a*) or contact the authors.

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AUTHOR

Karol L. Kumpfer, Ph.D.*
Director
Center for Substance Abuse Prevention
Substance Abuse and Mental Health Services Administration
Rockwall II Building, Ninth Floor
5600 Fishers Lane
Rockville, MD 20857

*When this meeting was held, Dr. Kumpfer was Associate Professor in Health Education, Department of Education, University of Utah, Salt Lake City, UT.

Prevention of Early Adolescent Substance Abuse Among High-Risk Youth: A Multiple Gating Approach to Parent Intervention

Thomas J. Dishion, Kathryn Kavanagh, and Jeff Kiesner

DEVELOPMENT AND ECOLOGY

Youths who begin using substances by the age of 15 constitute the group at highest risk for chronic abuse among young adults (Robins and Przybeck 1985). The risk for early onset substance use is entangled in the development of antisocial behavior in childhood and adolescence, a key antecedent (Dishion et al. 1995; Kellam et al. 1983; Smith and Fogg 1979). Knowledge of the risk factors and the developmental processes leading to early onset is crucial for the design of effective prevention programs. Although Hawkins and colleagues (1992) have documented a plethora of risk factors associated with adolescent substance use, there is a growing consensus among developmental and intervention researchers that parenting practices are at the center of the causal process (Baumrind et al. 1985; Block et al. 1988; Bry 1988; Dishion et al. 1988; Szapocznik and Kurtines 1989; Zucker et al. 1995).

The research by Dishion and colleagues (1995) indicated that poor parenting practices exacerbate antisocial behavior in childhood and adolescence. A stage model proposed by Patterson and colleagues explains how the emergence of antisocial behaviors in childhood can progress to more serious forms of problem behavior in adolescence (Patterson 1982; Patterson et al. 1992). Harsh coercive parenting has been associated with antisocial behavior and is correlated with academic problems, peer rejection, and depression. These secondary outcomes, coupled with poor parental monitoring, are related to a multitude of problem behaviors (Dishion et al. 1991; Elliott et al. 1985). Dishion and colleagues (1995) have found that early problems in family management, the antisocial behavior of the child, and peer rejection have effects on early onset substance use that is entirely mediated by association with deviant peers. Figure 1 provides an overview of a longitudinal test of a peer-mediated model on a sample of 206 boys involved in the Oregon Youth Study (OYS).

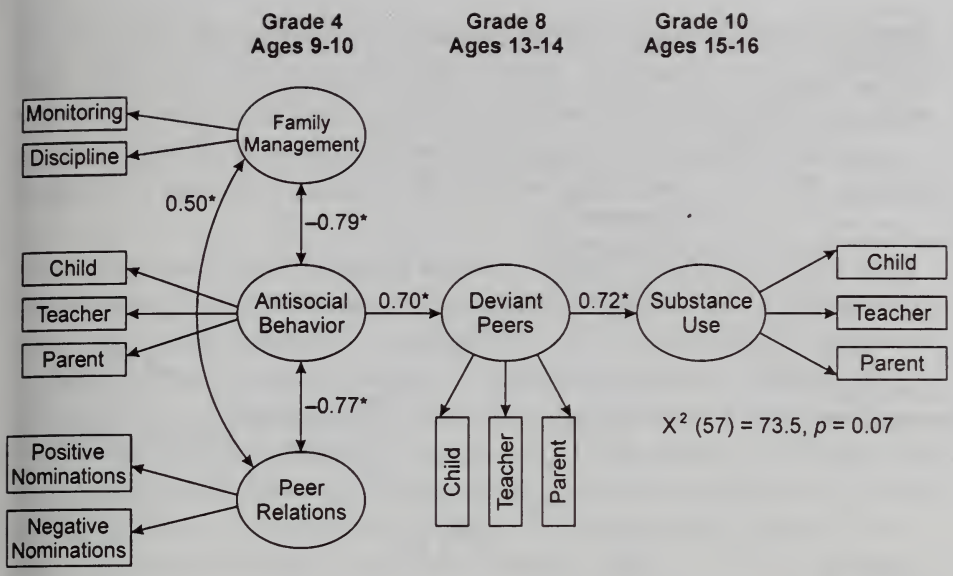

FIGURE 1. *A mediation model of adolescent substance use.*

*$p < 0.05$.

Parental monitoring practices are highly correlated (–0.72) with young adolescents' involvement in a deviant peer group (see figure 2). Moreover, parental monitoring and the density of drug-using peers, as well as the opportunities to use substances, are impacted by community contexts (Patterson et al. 1992). For this reason, an ecological model may be most appropriate in understanding the risks of problem behavior and in guiding prevention design across development (Dishion et al. 1995; Kellam 1990; Magnusson 1988; Rutter 1989). Bronfenbrenner (1979, 1986, 1989) provides a cogent and organized conceptual framework for considering the network of findings related to the etiology of antisocial behavior. The ecology of child development is a hierarchy of nested systems, beginning with face-to-face interactions, continuing on to behavior settings in which relationships take place, and on to macrocontextual influences such as cultural and community practices.

One implication of an ecological model is that for an intervention program to effectively reduce risk, it may be necessary to attend to the contextual factors that influence underlying causal processes and work within the relevant settings (Biglan 1995). The vast majority of the children in the United States attend school up to the age of 13 to 14 years old. Schools are a primary influence on adolescent problem behavior and serve as training grounds and a convenient meeting place for deviant peer groups (Dishion et al. 1994;

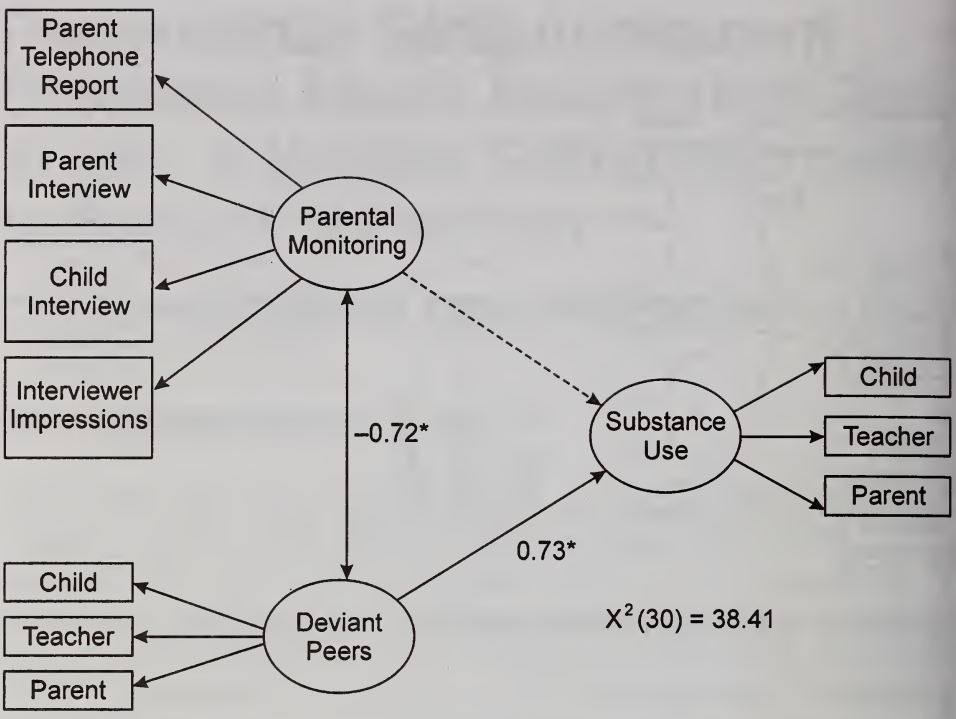

FIGURE 2. *Proximal effects of parent monitoring and deviant peers on substance use.*

*p 0.05

Kellam 1990; Rutter 1985). Prevention intervention programs need to "consider schools as a potential site for service delivery, as well as serve as potential objects of intervention activity" (Trickett and Berman 1989, p. 361). Communication between the school and parents is key to enabling parents' potential for monitoring, limit setting, and supporting academic progress (Gottfredson et al. 1993; Reid 1993).

Studies have shown that simply increasing specific information to parents regarding attendance, homework, and class behavior can improve monitoring and provide support for an at-risk child's academic and social success (Blechman et al. 1981; Heller and Fantuzzo 1993).

When children are at high risk (i.e., family disruption and a history of antisocial behavior problems), more intensive parenting interventions are quite successful. The most widely replicated intervention with conduct problem children is parent training (Kazdin 1987; Patterson et al. 1993). Family-focused interventions that support active and constructive

parenting are also effective in reducing substance use in high-risk youth (Bry 1988; Szapocznik and Kurtines 1989). The authors' research has provided a poignant example of the importance of supporting parenting as well as the harm of aggregating high-risk youths in interventions designed to prevent escalation of problem behavior.

The authors randomly assigned families of high-risk youths (N = 119) participating in the Adolescent Transitions Program (ATP) to four prevention interventions: (1) parent focus, (2) teen focus, (3) parent and teen focus, and (4) materials only. Following cognitive-behavioral principles, the parent focus and teen focus consisted of 12 group sessions. In addition, the authors studied the course of adjustment of 38 high-risk families without intervention who served as quasi-experimental controls. All families were comparable in terms of demographics and levels of risk. Two sets of findings emerged from this analysis. First and most important was an iatrogenic effect indicated by teacher ratings of problem behavior and the youths' self-report of smoking that was associated with aggregation into teen focus intervention groups (Dishion and Andrews 1995). Second, the parent focus was the most effective in reducing problem behavior, coercive parent-child interactions, and substance use (Dishion et al., in press). Figure 3 summarizes the short-term outcomes on tobacco use for the intervention groups.

Interventions directed at parenting practices should be comprehensive and responsive to the developmental history of the child and family. The key issue of an intervention that targets parents' engagement is titrating the level of need (the risk status of the child) to the level of support provided to parents for reducing their youngster's risk. The authors have developed a multiple gating intervention strategy that targets parenting practices and integrates universal-to-indicated interventions within a comprehensive framework. The "gating" metaphor, adopted from early work on multistage screening for high risk, describes the successive screening and resource allocation to families on the continuum of risk (Cronbach and Glesar 1965; Dishion and Patterson 1992; Loeber et al. 1984).

MULTIPLE GATING INTERVENTION STRATEGY

Based on the conventional levels of universal, selective, and indicated interventions, the multiple gating approach can best be described as a tiered strategy, with each level of intervention building on the previous

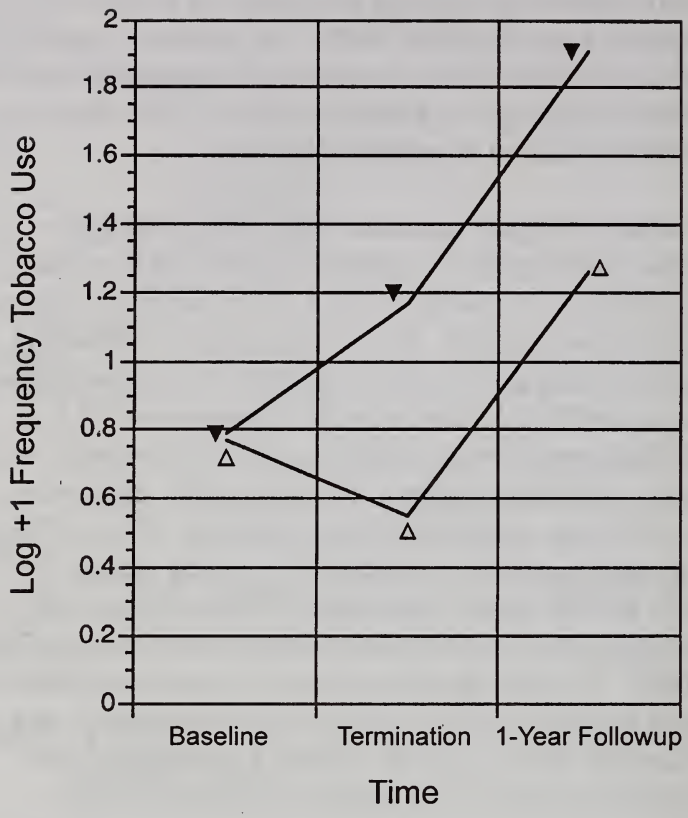

FIGURE 3. *Posttermination substance use in the Adolescent Transitions Program outcome study (parent and child monthly telephone interviews).*

KEY: ▼ Peer group; △control

one to reduce the overall prevalence of risk. The model is displayed in figure 4.

The universal level establishes a Family Resource Center within the school (e.g., middle school). The goal is to collaborate with school staff to engage parents, establish norms for parenting practices, and disseminate information regarding risks for problem behavior and substance use. The selective level of intervention and the Family Check-Up offer family assessment and professional support toward motivation to change. The indicated level provides direct professional support to parents for making the changes identified in the Family Check-Up. These services may include behavioral family therapy, parenting groups, or case management services. Following this tiered

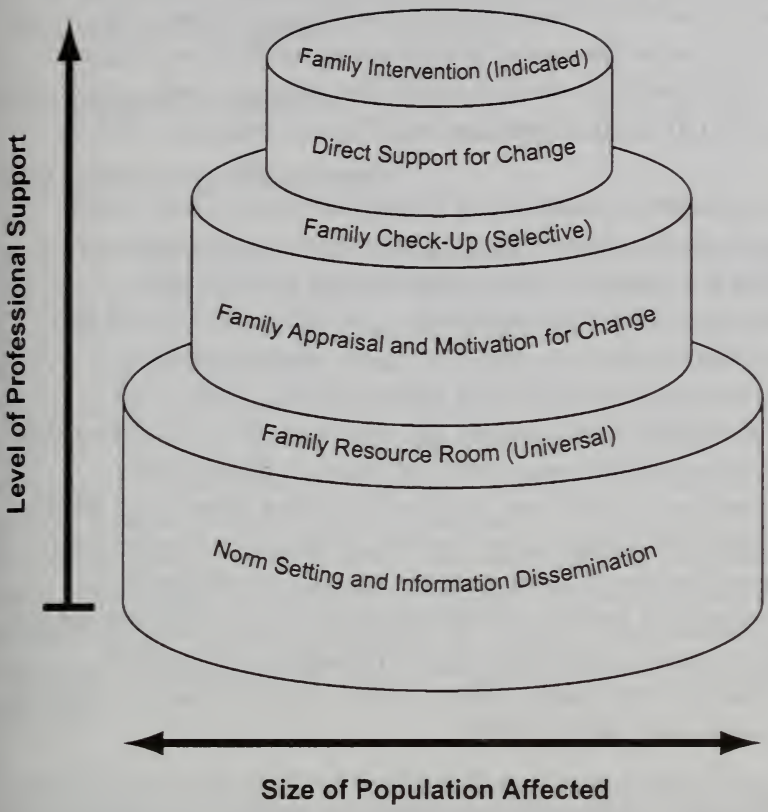

FIGURE 4. *A multiple gating model for parenting interventions within a school ecology.*

strategy, a family in the indicated family intervention would have participated in a Family Check-Up and received information from the school's Family Resource Room regarding risk factors for early onset substance use.

INTERVENTION LEVELS

Family Resource Center (Universal)

Services in the Family Resource Center are designed to reach all parents by providing an orientation to risk factors in parenting practices and youth behavior. For example, the authors have developed a videotape titled "Parenting in the Teenage Years," a self-assessment process that helps parents identify the observable risk factors in the context of

parent-child interaction. The videotape (designed to be viewed by all parents in the first week of school) presents examples of teen risk behavior and focuses on the use of effective and ineffective family management skills (positive reinforcement, monitoring, limit setting, and relationship skills) to facilitate evaluation of levels and areas of risk.

Following the orientation session, the Family Resource Center staff collaborates with health or homeroom teachers to assign a series of family exercises that support parent involvement, parent-child communication, and family management. For each of the key family skills, two communications are sent to parents. For example, in supporting the parents' reinforcement of their child's homework completion, a newsletter and exercise are sent to parents via a classroom assignment. First, the child and parent are asked to discuss how homework is encouraged at home, and the child then returns the family report to the school for collating by the Family Resource Center staff. A second communication that summarizes successful strategies for encouraging homework completion by use of positive reinforcement is then sent to the parents. This approach is consistent with a basic principle of effective community intervention: Build on the strengths of the targeted community (Kelly 1988).

The Family Resource Center can also serve as a nexus of communication by providing parents weekly information regarding homework, problem situations, and resources within the school. For example, a daily message to all parents in selected classes, and for the school in general, can enhance parents' awareness of homework assignments and events relevant to their child. Finally, the Family Resource Center can be a resource to school staff members who have concerns about effective strategies for developing a positive, collaborative relationship with parents. The universal prevention services provided by the Family Resource Center include the following:

- Parent-focused school orientation (self-check, books, and videotapes)
- Media on effective parenting and norms
- Classroom-based parent-child exercises that support family management practices

- Communication of specific information to parents about attendance, behavior, and completion of assignments

- Screening and assessment

Family Check-Up (Selective)

There are two interrelated issues in working with parents to support family management and change of maladaptive practices: therapeutic process and focus. There is extensive literature on key therapist behaviors that are considered to be the basic ingredients of any helping intervention, which began with the seminal work of Rogers (1957). During the 1980s, the authors' colleagues at the Oregon Social Learning Center began to study client "resistance" in behavior family therapy. In a series of studies, Patterson and colleagues (Patterson and Chamberlain 1994; Patterson and Forgatch 1985) found that teaching and confrontation actually elicited parent resistance to change, whereas support, reframing, and questioning were more conducive to change. This literature forms the basis for the motivational interviewing component of the Family Check-Up.

The issue of focusing on the process of family interventions is an emerging research problem. Over the years, innovative family intervention researchers have suggested that providing feedback to parents based on the findings of psychological assessments is conducive to change (Sanders and Lawton 1993). The critical feature of such feedback is that it is presented in a supportive and motivating manner. The ATP Parent Focus program provided feedback to parents prior to the first intervention session. To examine the impact of such feedback, the authors compared the weekly parent reports of child behavior problems for those who "responded" to the parent focus intervention with those who did not. Immediate change suggested that the feedback session and self-monitoring of parenting is an important first step in the change process. As can be seen in figure 5, parents' report of the child's substance use and antisocial behavior changed dramatically by the fourth session for those who responded to the parent focus intervention. Patterson (1979) also found a similar effect on the child's observed aggressive behavior in the home. As a result, the authors incorporated the Family Check-Up as the key component of a selective intervention that targets parenting practices.

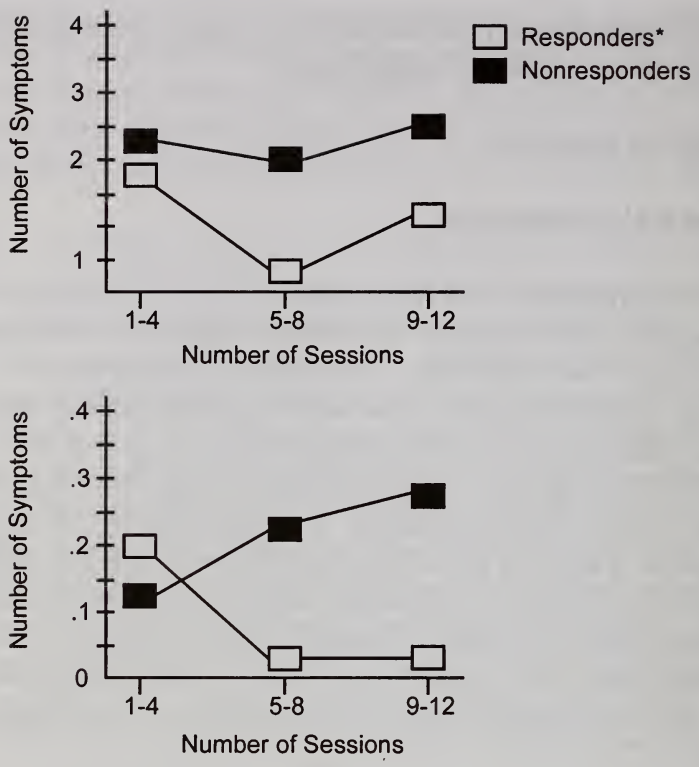

FIGURE 5. *Weekly parent reports of child antisocial behavior and substance use during the Adolescent Transitions Program's Parent Focus program.*

*For responders, both mother and adolescent moved from distressed to normal range on observations of conflict in the Family Problemsolving Task (see Dishion and Andrews 1995).

The Family Check-Up is an indepth method to assist parents in accurately appraising their child's risk status and to provide parenting resources for reducing risk factors and promoting adjustment. The authors have developed a procedure based on the Drinkers Check-Up (Miller and Rollnick 1991; Miller and Sovereign 1989) that consists of two meetings in the Family Resource Center (approximately 2 hours each), using multiagent, multimethod assessments and a feedback session:

- Assessment of strengths and needs
  - Child behavior: Home and school
  - Parenting practices
  - Observed parent-child communication

  - Emotional well-being of family
  - Family context

- Family feedback session
  - Identify strengths and barriers
  - Build motivation to change (e.g., frames)
  - Develop menu of coherent intervention options

Motivational interviewing is used to enhance risk appraisal and to support parents' commitment to change strategies. The FRAMES model (Miller and Rollnick 1991) guides the family feedback session: F stands for providing feedback to the client on the basis of objective assessments; R, parents are encouraged to accept responsibility for those practices that are within their power to change and control; A stands for advice provided by the consultant on the basis of what are known to be effective interventions for high-risk children; M means that a menu of intervention options is offered to clients, rather than an intervention solution, and the consultant and client together decide what is realistic and in the best interest of each family; E represents accurate empathy, a basic ingredient in all effective therapeutic interactions with clients (Rogers 1957); and S refers to self-efficacy: Through support and realistic advice, the parents leave a Family Check-Up feedback session with information on how to best focus their resources to promote adaptation and reduce risk in their young adolescent.

The first session of the Family Check-Up assesses child, parent, and family variables. Information is gathered on those constructs of most concern: the child's problem behavior, parent-child interactions and communication processes, monitoring, and the child's peer network. A second session presents families with normative comparisons regarding the status of their child and family and offers supportive consultation regarding steps they could take to improve their family life and their child's adjustment. This is a minimal intervention strategy that has the primary objective of enhancing the parents' appraisal of risk factors and supporting their interest in change.

After families are provided with information in the Family Check-Up, decisions are made regarding the next step. Many families in an identified risk group will have strengths that outweigh weaknesses or risk factors. For these families, the Family Check-Up will serve to support their existing efforts and provide them with a realistic estimate of their future risk. Concerns regarding risk will be more salient in other

families. In this situation, a family consultant can discuss an intervention menu relevant to each family's needs. The family consultant's role is to support parents in making informed selections and to offer advice when requested.

Consistent with building a strong connection between home and school, parents at this level of the multiple gating strategy can also be supported in their efforts through a school monitoring service of their child. This service provides a weekly telephone summary of attendance, behavior in class, and homework completion. Such telephone contacts can be greatly enhanced by voice-mail technology. To increase parents' use of family management skills and to minimize punitive coercive discipline, the home-school monitoring system is made available to parents contingent upon their attending at least two parent training sessions: one prior to using the system and the second several weeks later to refine and clarify skills. These training sessions focus on teaching parents how to provide incentives for positive school weeks and how to communicate with school staff members about school problems.

Family Intervention (Indicated)

This level of intervention involves approaches described in several protocols by behavioral, structural, and eclectic family therapists working with problematic adolescents (Bry et al. 1991; Dishion and Patterson 1992; Forehand and McMahon 1981; Henggeler et al. 1992; Patterson 1982; Szapocznik and Kurtines 1989).

On the basis of results from an adaptation of the Systematic Screening for Behavior Disorders instrument (SSBD) (Walker and Severson 1991), 10 percent of the families will be identified as in need of intensive intervention and support. The number of sessions and the goals of the family intervention will be directed by the parents. The optimal strategy is to work with the entire family. However, when that is not feasible, such as in the case of a reluctant parent figure, the authors suggest working with whomever is willing and relevant to addressing the best interests of the youth (Szapocznik et al. 1988).

The level of services provided to parents in the family intervention is developed in collaboration with parents. Some parents may require only brief, focused interventions on communication practices, while others may benefit from more intensive behavioral family therapy. A menu of services is shown below:

- Home-school card
- One to two sessions on special topics
- Individualized behavioral family therapy
- Case management-family preservation
- Referral to foster care

The first step in the parent training model is to have parents clearly and objectively specify their concerns and initially track these targeted behaviors as they occur at home and at school. In consultation with parents, strategies to reinforce the prosocial opposite of the targeted behavior are developed. For example, a "bad attitude" often leads to parents targeting "cooperating with requests to help around the house." Parents also are taught to use the daily information from the school to support their middle school student's success. Parents are encouraged, as a first step, to reinforce positive behavior. The second step for many parents is to reduce the use of irritable, harsh reactions to misbehavior and to be more consistent in setting limits with their adolescent. Third, when parents are more effective in rewarding positive behavior and limit setting, they can also be more effective in monitoring and supervising their youth's whereabouts, especially unsupervised time with deviant peers. Communication skills are the foundation for a positive parent-child relationship and for negotiating solutions to conflict (Forgatch 1989).

Some (particularly single parents) may prefer the support of other parents in the behavior change process and select the parent group sessions. Following the guidelines of a behavioral family therapy model, the authors have developed a curriculum and related materials for these groups (see figure 6).

In addition to teaching parenting skills and providing support for change, supervision and support for the intervention staff is an integral component of the prevention model.

The integrity of the indicated intervention is ensured by close supervision and weekly case review sessions. Family sessions should be either videotaped or audiotaped to continue the analysis of client engagement and the collaborative relationship of parents and consultants in the intervention process. The indepth case review is a problemsolving session. The intervention team serves two functions: (1) providing support to the staff primarily responsible for the case and (2) brainstorming

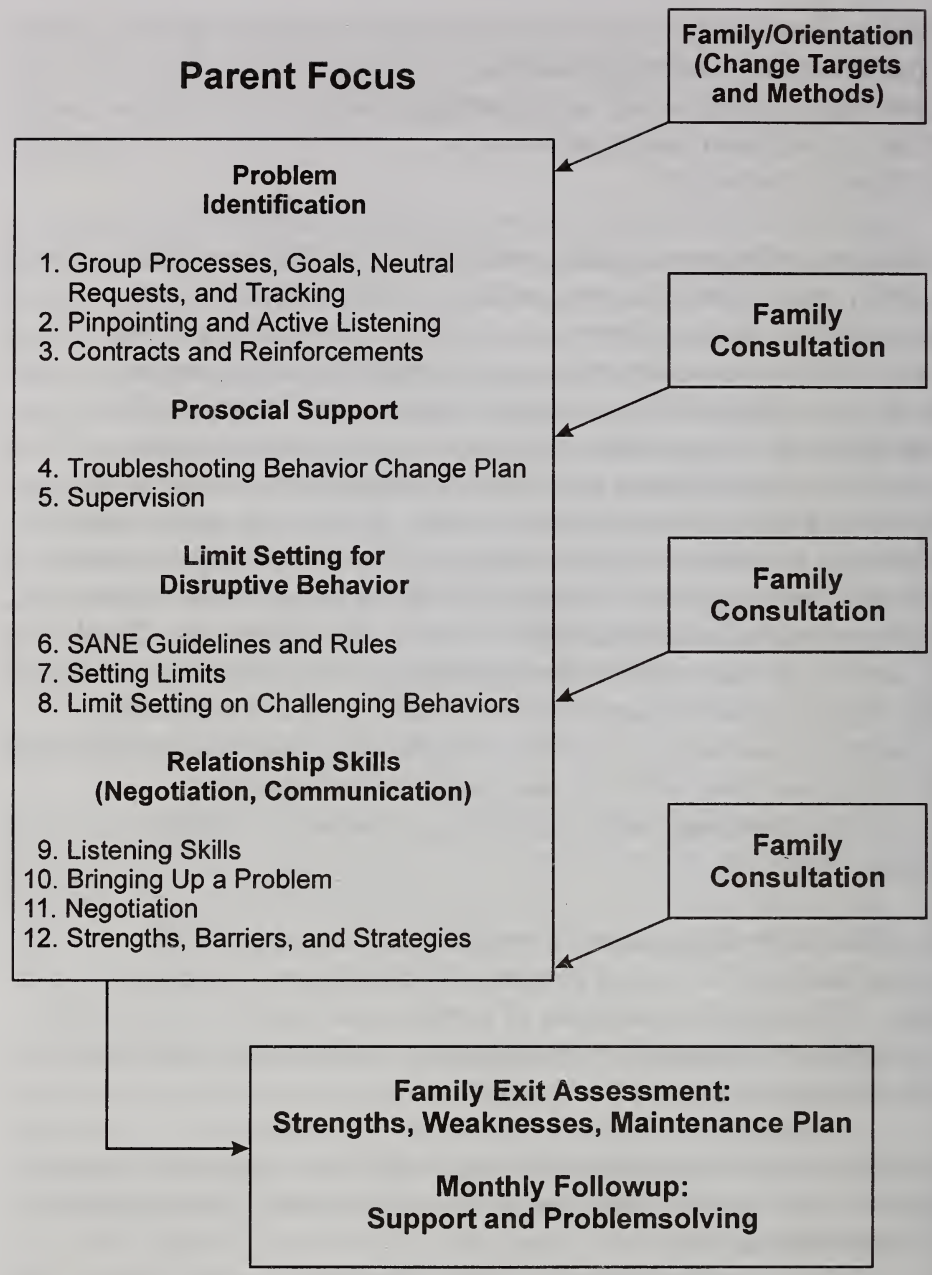

FIGURE 6. *Overview of Parent Focus curriculum.*

intervention strategies that are consistent with the intervention model and effective in dealing with barriers to behavior change. From these reviews, a culture of expertise and support emerges within the clinical group, which is essential for working with high-risk families.

Based on existing data on the etiology and ecology of substance use and related antisocial behavior in early adolescence, a tiered model of family intervention offers promise. However, the effectiveness of these interventions needs to be extensively tested.

PILOT STUDIES

The authors have begun this work in a pilot study of the Family Resource Center and Family Check-Up. A Family Resource Center was developed in two middle schools and one high school.

Utilization of the Family Resource Center

The authors were generally encouraged by the demographic makeup of the sample and by the number of families that used the Family Resource Center—118 families across sites. These families were equivalent for child gender. The ethnic composition of the utilization group was commensurate with the demographics of the school populations. Students were evenly distributed across grades at the middle schools. In the high school, most of the students were in the ninth grade.

For any family, the average number of sessions at the center was two, and eight families came for only one consultation session (as the year progressed, increasing numbers of families checked out videotaped information). Families came to the center for a variety of teen problems. In the middle schools, the largest percentage of concerns centered around homework, school attendance, and behavior problems. Twenty-two percent of the families came to the Family Resource Center for homework skill building and monitoring.

The next most common areas of concern were behavior management and relationship quality at home. Peer conflicts at school and supervision (access to deviant peers) were also common themes. Families appeared to be comfortable bringing a wide range of issues to the center (e.g., grief, stepparenting, and drug and alcohol problems).

The authors were able to offer two, two-session Parent Nights, one on supervision and one on homework skills. The Parent Nights were well received; they led to good information exchange and the development of a group of parents that planned to meet regularly on supervision and related parenting issues. Following an ecological model in discussions

of supervision, the authors developed a list of neighborhood "hot spots." These were areas that parents, police, and school staff members identified as places where troubled kids congregate. The Parent Nights also led to followup appointments for a Family Check-Up.

The Family Check-Up Session

The authors conducted 17 Family Check-Ups following the model outlined earlier. The feedback sessions provided validation for family concerns and additional information that served as a helpful starting point for resolving the child's problems. Depending on the family dynamics and the student's age, separate feedback sessions for parents and teens were a useful strategy for motivating change. Fifty percent of these families followed up on a referral suggestion to use resources outside of the school. Another 25 percent made a followup appointment with the Family Resource Center for family management and relationship skill development.

Consumer Feedback

To assess the impact and benefits of the multiple gating model of services within the school, the authors developed an impact survey for teachers, administrators, and the school staff and a utilization survey for parents. Independent evaluators were used to avoid problems of social desirability and author biases. Data are currently being collected; therefore, results are incomplete but promising.

The staff at each of the three sites indicated that the Family Resource Center was perceived as a benefit to both the school and the families by (1) the ability to consult with the Resource Center staff, (2) the improved accuracy of information between parents and teachers, and (3) the increased parent involvement in students' academic progress. The parents seemed more willing to accept the school's information about their child.

The utilization survey collected information on physical location, assessment procedures, feedback, resources, and staff. To date, only one-fifth of the data has been collected. The available information has been generally very positive, and reports indicate that having family resources in the school was seen as a convenience for bringing up family concerns and improved the ability to work on school-related issues. Parents who received Family Check-Ups appreciated the method of

receiving feedback and reported that it confirmed and added to their information.

Families were also forthcoming in making suggestions about improving the physical space and requesting additional methods of consultation, such as a phone service. Parents said that a phone component would help with scheduling, work, and immediacy of consultation, which are all typical barriers to accessing intervention.

CONCLUSION

Based on developmental studies of adolescent substance use, it is known that early onset is a major risk factor for drug abuse by late adolescence and young adulthood. Youths with a history of antisocial behavior are most at risk for early onset, which is also highly embedded within a drug-using peer group. The bulk of the evidence suggests that an important target for prevention programs that hope to reach the highest risk children is parenting practices. Targeting parenting practices is an underdeveloped strategy for the prevention of adolescent drug use.

One of the difficulties in implementing prevention strategies that target parents is the issue of engagement. For example, Stouthamer-Loeber and colleagues (in press) found that only 40 percent of families with young delinquents received any intervention services targeting parenting practices. The authors suggest that to reach high-risk parents (and maximize effectiveness), such services need to be tightly embedded within the school context.

Family interventions are generally the most effective strategy for changing the behavior of the high-risk young adolescent (Bank et al. 1991; Dishion and Andrews 1995; Henggeler et al. 1992; Szapocznik and Kurtines 1989). Less is known about the efficacy and achievement of intervention goals of the Family Resource Center and Family Check-Up. The dependent variables for each are quite different. Services of the Family Resource Center are expected to educate parents regarding the risk factors, mobilize use of parenting resources, and perhaps increase parents' general monitoring of their child's school progress. The Family Check-Up, however, may have more pervasive effects. That is, increasing motivation to change may set off a behavior change cycle that does not depend on contact with an individual therapist or counselor. Many parents may elect to self-change and may be quite

effective in doing so, while others will request or require more intensive family interventions. The answer to these questions will have dramatic implications for making systemic changes to service delivery in schools and to the potential for adding cost-effective intervention strategies to the burgeoning prevention armamentarium.

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ACKNOWLEDGMENTS

This project was supported by National Institute on Drug Abuse grant no. DA-07031 to Thomas J. Dishion, by National Institute of Mental Health grant no. MH-37940 to John B. Reid, and by National Institute of Mental Health grant no. MH-46690 to Gerald R. Patterson.

AUTHORS

Thomas J. Dishion, Ph.D.
Principal Investigator
Oregon Social Learning Center
and
Associate Professor
University of Oregon

Kathryn Kavanagh, Ph.D.
Research Associate

Jeff Kiesner, M.S.
Research Associate

Oregon Social Learning Center
207 East Fifth Avenue, Suite 202
Eugene, OR 97401

Parental Monitoring and the Prevention of Problem Behavior: A Conceptual and Empirical Reformulation

Thomas J. Dishion and Robert J. McMahon

Research on parenting practices has revealed parental monitoring to be relevant to the safety of children (Peterson et al. 1993), the development of childhood antisocial behavior and substance use (Dishion, Li, Spracklen, Brown, and Haas, this volume), and academic achievement (Crouter et al. 1990). Parental monitoring, however, is not often the explicit target of even parent-focused prevention strategies. In this chapter, therefore, the authors focus exclusively on the construct of parental monitoring with respect to definition and developmental issues. In addition, measurement strategies and specific issues related to targeting monitoring in preventive intervention trials are discussed.

One of the appealing features of the parental monitoring construct is that it is a common denominator across diverse intervention and developmental models that focus on parenting practices. All models of parenting acknowledge and promote a natural hierarchy in the parent-child relationship, in which the adult assumes leadership. Indeed, parenting is a complex process, requiring responsiveness to the age and ecology of the child. Several constructs are used to describe this process, including relationship quality, limit setting, positive reinforcement, problemsolving, and involvement. Investigators often differ, however, on which of these constructs take priority with respect to family intervention.

The data do not support a narrow view of the parenting process. Under close psychometric scrutiny, in fact, these constructs are found to be highly interrelated (e.g., Dishion, Li, Spracklen, Brown, and Haas, this volume; Patterson et al. 1992). Thus, schemes that presuppose orthogonal dimensions of parenting (e.g., warmth and control) may not be empirically or conceptually justified (Darling and Steinberg 1993).

From an applied perspective, parenting practices are seen as dynamically connected within a system of tasks and interactions that are mutually dependent and hierarchically embedded. Behavioral interventions

proceed hierarchically, beginning with definitions (e.g., focusing on "key events"; Dishion and Patterson, in press), and then moving on to tracking and monitoring (Patterson et al. 1975). Once behavior change is identified and the problem is assessed vis-a-vis monitoring, positive approaches to behavior change (e.g., the use of incentives) are suggested. SANE (a good consequence is Small, Avoids punishing the parent, is Nonabusive to the child, and is Effective) limit setting is suggested to reduce problem behaviors that do not respond to positive approaches or that threaten the health and safety of the child (Dishion, Kavanagh, and Kiesner, this volume; Dishion and Patterson 1996).

These three behavior change phases stimulate the conceptual model of parenting shown in figure 1, delineating three dynamically interrelated dimensions of parenting that are relevant to prevention: (1) motivation, which represents the parent's belief system (i.e., social-cognitive framework) including norms, values, and parenting goals; (2) parental monitoring, the tracking and structuring of child activities and ecology; and (3) behavior management, the parent's active attempt to shape positive child outcomes by using incentives, scaffolding, limit setting, and negotiation.

The foundation of parental motivation, monitoring, and behavior management is the quality of the parent-child relationship. It is difficult to extricate the emotional quality of the relationship from belief systems or the specifics of parent-child interactions. Relationship quality within the family is critical to children's well-being and social development (Belsky and Nezworski 1988). A positive parent-child relationship enhances parents' motivation to monitor their child and to use healthy behavior management practices. For example, the parent-child relationship may become stressed when the child becomes an adolescent and demands autonomy (Galambos 1992; Gjerde 1986; Steinberg 1987). This, in turn, may lead to a deterioration in parenting practices due to the disruptive impact of negative emotions (Forgatch 1989). Conversely, monitoring children's activities is essential to establishing and maintaining a positive parent-child relationship. In the event that child behavior problems emerge, the parent-child relationship becomes undermined (Patterson 1986; Patterson and Dishion 1988). A negative report from the school about behavior problems may eventually lead to parent rejection, rendering the parent recalcitrant to change.

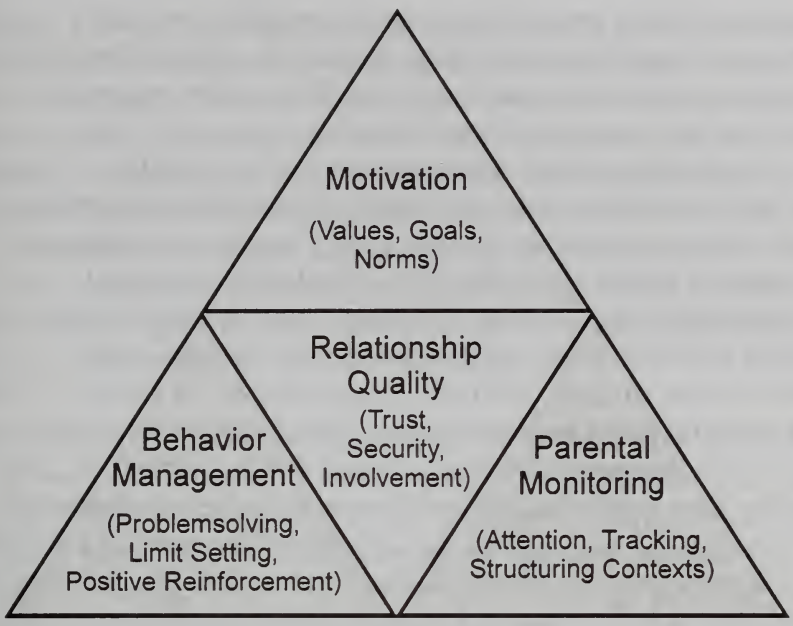

FIGURE 1. *The parenting triad: motivation, parental monitoring, and behavior management embedded within the parent-child relationship.*

It is in this sense that specific parenting practices and the quality of the relationship are dynamically related. Parental monitoring is particularly relevant to prevention science because of its critical role in the behavior change process and the fact that it is a potentially malleable parenting behavior. The authors propose that adequate parental monitoring is a necessary but not sufficient condition for effective parenting and for improved adaptation for the child. In addition, parental monitoring may serve as a protective factor for children living in high-risk settings.

EMPIRICAL RATIONALE

There are at least four areas of child and adolescent research in which some aspect of parental monitoring is considered to play an important role: safety and injury, antisocial behavior, substance use, and academic achievement. Whereas there has been some cross-fertilization and collaboration among researchers in the antisocial behavior and substance use areas, there has been relatively little communication between these researchers and those working in the other areas.

Two aspects of injury prevention research concerning parental monitoring distinguish it from similar research in antisocial behavior, substance use, and academic achievement. First, injury prevention research involves younger children (infancy to age 4 or 5), with occasional examples of studies done with school-age children. Second, much of the research has addressed issues related to parental attitudes and beliefs about monitoring. For example, Peterson and colleagues (1993) assessed beliefs about the appropriate levels of parental monitoring required for children of different ages (infancy through age 10) and in different settings of varying risk. Mothers, child protection service workers, and physicians indicated the amount of time children should be left unsupervised in different settings within the home, the yard, the street, the neighborhood, and in a parked car. All three groups of respondents indicated the need for increased parental monitoring with increased risk in the setting and less parental monitoring with increasing child age. However, there was tremendous variation in the actual time estimates required for appropriate parental monitoring, especially for school-age children.

In a study by Garling and Garling (1993), mothers rated the degree of risk and anticipated injuries to their 1- to 3-year-old children under four levels of parental monitoring: (1) child plays alone while mother is in another room, (2) child plays alone while the mother attends to her work in the same room, (3) child helps mother with her work in the same room, and (4) mother plays with child in the same room. In general, mothers reported lower perceived levels of risk to their children in situations that allowed more parental monitoring, although this was more the case for younger, rather than older, children.

Lack of sufficient parental monitoring has been implicated in accidental poisonings (Brayden et al. 1993), exposure to household safety hazards (Glik et al. 1993), playground accidents (Buck 1988), and handling of hazardous substances in grocery stores (Harrell and Reid 1990). Thus, interventions that target parental beliefs and practices regarding the supervision of young children are likely to reduce the rate of injury.

There is a long history of interest in the parental monitoring construct within psychology (conduct problems) and sociology (juvenile delinquency) (Loeber and Dishion 1983; Patterson 1982). Research in this area has traditionally focused on adolescents, and researchers have typically employed the term "supervision" to describe parental monitoring (Craig and Glick 1968; Glueck and Glueck 1959; McCord et al. 1963; West and

Farrington 1973). Parenting practices that fall within the realm of parental monitoring have demonstrated empirical validity in several longitudinal studies. Parental supervision during childhood, as measured by home visitor impressions, was one of the better predictors of male adolescent delinquency across several classic delinquency studies (Loeber and Dishion 1983; Loeber and Stouthamer-Loeber 1987). In fact, a constellation of family factors relevant to parental monitoring (i.e., family disorganization and poor parental supervision) consistently provided the best predictions of adolescent problem behavior, even in comparison with problem behavior in childhood.

The label change from parent supervision to parental monitoring was made to facilitate the translation to intervention strategies for parents with troubled children (Patterson 1982). Using a multiagent, multimethod approach to measure parental monitoring proved to be an important addition to an emerging developmental model of antisocial behavior. Patterson and Stouthamer-Loeber (1984) found that as children approached adolescence, more of their time was spent in unsupervised activities. Individual differences in parents' monitoring practices correlated with levels of antisocial behavior in boys. Patterson and Dishion (1985) used structural equation modeling to test a model for the impact of poor parental monitoring on delinquent behavior. Parental monitoring was found to have both a direct and an indirect effect on delinquent behavior. Dishion and colleagues (1991) found poor parental monitoring to be a significant factor in children's development of a deviant peer network in early adolescence, after controlling for prior levels of peer rejection and antisocial behavior.

Stoolmiller (1994) has identified a "wandering" construct to describe the tendency of some preadolescents and adolescents to actively avoid adult supervision by spending time in unsupervised community contexts. Patterson (1993) found that wandering and deviant peer involvement accounted for growth in problem behavior throughout adolescence, and poor parental monitoring and limit setting accounted for the initial levels of antisocial behavior serving as the starting point for adolescent problem behavior.

There are longitudinal data suggesting that serious antisocial behavior can be an outcome of a progression from relatively trivial behaviors to increasingly dangerous behaviors (Patterson et al. 1992). Inadequate parental monitoring has been implicated in fire setting in children (Kolko and Kazdin 1986, 1990). Parents of children ages 6 to 13 who set fires

reported significantly less monitoring than parents of children who did not set fires. Parents of children who engaged in match play only did not differ from either of the other two groups of parents.

Several investigators have linked low levels of parental monitoring to early substance use (e.g., Baumrind et al. 1985; Brown et al. 1993; Fletcher et al. 1995). Dishion and Loeber (1985) found that parental monitoring was both directly and indirectly correlated with young adolescents' alcohol and marijuana use. In a subsequent study, parental monitoring was associated with children's drug sampling as early as 9 or 10 years of age (Dishion et al. 1988). Programmatic studies by Chilcoat and colleagues (1995) have extended these findings in several important ways. They have provided a replication of the relationship between children's report of monitoring rules and early drug experimentation at ages 9 and 10, using logistic regression techniques that included only new initiations. Working with a multiethnic urban sample, Chilcoat and Anthony (1996) documented that poor monitoring was prognostic of early initiations through late childhood. In general, the relation between monitoring and early drug experimentation held across neighborhoods and ethnic groups. Parental monitoring did not vary significantly by ethnic status; it did, however, vary as a function of the child's gender. Girls are monitored more than boys, a finding consistent across several studies (Dishion, Li, Spracklen, Brown, and Haas, this volume).

A low level of parental monitoring after school is critical to early-onset substance use. Several investigators found that in early adolescence, poor monitoring after school is associated with smoking (Radziszewska et al. 1996; Steinberg 1987). High-risk settings for substance use, or "hot spots," vary across communities. In less than a 1-hour exposure to a community hot spot, young adolescents can initiate a substance use career, often beginning with cigarette smoking. One hot spot particularly prevalent and troublesome to middle-school youth is the home of an unsupervised child. Friedman and colleagues (1985) found that over 80 percent of smoking initiation episodes occurred in friends' houses without a supervising adult.

The relationship between parental monitoring and child academic achievement has recently been explored, albeit with somewhat contradictory findings. For example, in a study by Crouter and associates (1990), lower levels of parental monitoring were associated with lower grades for boys only (ages 9 through 12). Kurdek and colleagues (1995) reported a curvilinear relationship between parental

monitoring and child grade point average in their sample of sixth graders. Moderate levels of monitoring were associated with the highest grade point averages. Alternatively, parental monitoring was positively associated with achievement test scores only in conjunction with low levels of parent autonomy-granting. Similarly, Coley and Hoffman (1996) reported that, in two-parent families, lower levels of parental monitoring were associated with higher standardized math achievement scores in their sample of third- and fourth-grade students. However, children in two-parent families who were monitored scored higher than children in single-parent families with comparable levels of monitoring. This pattern of findings was not obtained for reading or language achievement scores. These studies suggest the necessity of considering a variety of potential moderating variables (e.g., neighborhood risk, single parent, maternal employment status, parent education) in explaining the relationship of parental monitoring to child academic achievement.

Despite the theoretical appeal, potential malleability, and empirical support for the parental monitoring construct, there has been a lack of attention to relevant definition and measurement that is critical to integration within prevention trials that target parenting practices. Discussion of these issues follows.

Parental Monitoring Defined

Definitions in the areas in which parental monitoring has been of particular interest (i.e., safety and injury, antisocial behavior, substance use, and academic achievement) have tended to be idiosyncratic. For example, researchers in the antisocial behavior and substance use areas typically have limited their definition of monitoring or supervision to parental awareness of a youth's peer group and his or her whereabouts in the neighborhood. Populations of interest have usually been adolescents (exceptions include Chilcoat et al. 1995 and Dishion et al. 1988). Researchers in the injury prevention area have focused on the extent to which parents supervise their children in the home, and much of this research (often conducted with samples of infants and young children) has focused on beliefs and values rather than practices. Researchers in the academic achievement area have tended to focus on samples of school-age children (third to sixth grade). Definitions of parental monitoring have varied, but have tended to be more operationalized than in the other areas. For example, Coley and Hoffman (1996) distinguished between in-person proximal contacts with the child (which they termed

"supervision") and distal parental influence via telephone contact or by rules (termed "monitoring").

The authors propose that parental monitoring, broadly defined, is a skill that is important throughout the developmental period, from infancy through adolescence, and perhaps even into young adulthood.[1] While the specific methods and foci of monitoring will change at different developmental periods, the function of these activities is essentially the same: to facilitate parental awareness of the child's activities and to communicate to the child that the parent is concerned about, and aware of, the child's activities.

One reason for preferring the term "monitoring" over "supervision" is that the former encompasses a larger set of critical parent activities. Parental monitoring practices involve both structuring of the child's environment and "tracking."

Relative emphasis on these behaviors has also tended to vary as a function of the area of research. All have focused on tracking of the child; however, the extent to which this tracking has referred to an awareness of the child's location and activity at a particular moment has varied, even within areas. Structuring the child's environment to facilitate tracking can be done by actual physical modification (e.g., placing a baby monitor in the child's room, enrolling the child in an after-school recreation program, keeping the TV turned off while homework is being done) and by the use of verbal mediators, such as rules (e.g., "You may not go off the block," "Homework is done immediately after dinner."). While the use of rules is promoted by all areas, environmental structuring has tended to occur more frequently in the injury prevention area.

Clearly the child's ecologies vary with age and the context within which the family functions. The authors consider it essential that the definition and measurement of parental monitoring reflect these developmental and ecological variations. For infants and toddlers, the home setting is most common. Once children enter school, monitoring of the child's attendance, behavior (in the classroom, on the playground, on the bus, etc.), and academic achievement become important goals. As the peer group assumes increasing importance in the later elementary school years, it is essential that monitoring also include a focus on children's peer associates and their activities and whereabouts in the community. There are also

cross-contextual aspects of monitoring. For example, parental monitoring at home should also include supervision of the child's homework.

Other contextual influences, such as family structure, the safety of a particular neighborhood, and cultural/ethnic variation must be considered. Parental monitoring may vary as a function of the number and availability of parental figures. Monitoring may be less effective in a family headed by an isolated single parent who is socioeconomically disadvantaged than in a middle-class family with two parents or a single-parent family with sufficient income and a supportive parenting network (Dumas and Wahler 1983). If extended family members play an active role in childrearing (as is found in many ethnic groups and cultures), the extent and quality of their monitoring must be taken into account. A sole focus on the monitoring of the biological parent would drastically underestimate the amount of monitoring that the child is actually receiving. Finally, the relative safety/danger of a particular neighborhood may play a role in the extent to which high levels of monitoring may be warranted (Richters and Martinez 1993). The evidence suggests that monitoring may be a protective factor related to lower rates of delinquency in high-risk environments (Wilson 1980).

Another limitation of research on parental monitoring has been the focus on monitoring practices or behaviors, to the near exclusion of parent motivation, which includes a complex set of social cognitions (i.e., beliefs and values) related to monitoring (Harris and McMahon 1998). There is increasing recognition of the role that beliefs and values play in affecting various parenting practices (Holden and Edwards 1989; Johnston 1996). Much like parent-child relationships, beliefs and values regarding parenting are dynamically related to monitoring practices and could play a role in the extent to which parents consider monitoring to be an important, or even necessary, parenting practice. Parental social cognitions may serve to motivate or drive parental behavior and may also moderate the effect of external factors such as life stressors on child behavior (Johnston 1996).

Patterson (in press) proposes a mediation model suggesting that social cognitions influence the performance of monitoring practices, which in turn impact children's outcomes. The extent to which parents themselves were monitored as children or adolescents may play a role in determining whether they believe that monitoring is important; parental beliefs as to what constitutes appropriate levels of effective monitoring might influence the extent to which they engage in monitoring behavior. With respect to

the moderation of external factors, Wahler and Dumas (1989) have suggested that stressors such as maternal depression, daily hassles, and unemployment or health problems may serve to disrupt parental attention to child behavior. This could then lead to difficulties in parents' abilities to monitor their children effectively.

A broader conceptualization of parental monitoring is required. An adequate model of parental monitoring must include the following:

- Structuring of the environment and tracking by parents.
- Consideration of the entire span of the developmental period (i.e., infancy, childhood, adolescence, and into young adulthood).
- Assessment of various ecological contexts that are developmentally relevant for children of a particular age (e.g., home, school, and neighborhood).
- A distinction between monitoring values (parental social cognition) and practices (parenting behavior). Motivation to monitor is therefore seen as a necessary, but not sufficient, condition for actual monitoring.

Given these considerations, the authors propose the following definition of parental monitoring:

> Monitoring of the child by parents is one component in the constellation of effective childrearing practices. Parental monitoring includes both structuring the child's home, school, and community environments and tracking the child's behavior in those environments. Parental monitoring plays an important role from infancy into young adulthood and should be developmentally, contextually, and culturally appropriate. Positive parental social cognitions concerning monitoring are a necessary but not sufficient prerequisite for the successful implementation of parental monitoring practices.

Some of the key measurement issues to consider when incorporating parental monitoring within intervention research are discussed below. These issues have emerged in the context of clinical and developmental research involving the measurement of parenting practices, parental monitoring, and change as a function of intervention.

Measurement Issues

Parental strategies for tracking the child and structuring supervised contexts vary with the age of the child. Table 1 provides a measurement framework for studying parental monitoring from infancy through adolescence. Parental tracking and structuring of child behavior vary as a function of the developmental status of the child and the ecology of the family. As shown in table 1, the majority of parental monitoring in infancy and early childhood occurs in the home setting. Initially, it involves basic caretaking of the infant's physical and emotional needs. Once the child becomes mobile, it also involves tracking the toddler's behavior and whereabouts to ensure safety. Scaffolding is a parent tactic that provides the appropriate level of support for young children to share in routine tasks that promote cognitive development and competence. To provide such scaffolding, parents need to monitor the child's competence and adjust tasks to fit within the zone of proximal development (Rogoff and Wertsch 1984). Measurement techniques during early childhood depend on direct observations and adult (parent and significant others) reports, as well as home visitor impressions. These measurement methods carry forward into childhood and adolescence, but the content shifts relative to the developmental status of the child. Children and adolescents are verbally interactive; therefore, much of parental monitoring is verbally mediated through the use of basic parent-child discussion of the child's whereabouts, activities, and with whom they spend time.

In all human cultures, parental monitoring is accomplished to some extent by arranging for surrogate care. In Western cultures, surrogate care is often formal, not involving extended family or community members. In infancy and early childhood, this formal care is associated with the economic resources to pay for an inhome caregiver or a day-care center. In childhood and early adolescence, babysitting is arranged to care for children when adults are away. Children and adolescents are often involved in structured activities that include adults (e.g., organized sports, church or school groups). As discussed previously, it is important to measure after-school monitoring. In general, the nature of such surrogate care and involvement in structured activities would be an important index of monitoring throughout development.

TABLE 1. *Ecologically focused measurements of parental monitoring from infancy through adolescence.*

Developmental Period	Key Ecologies	Observable Processes	Measurement Strategies
Infancy	Home Surrogate care[b]	Sychronicity[a] Caretaking[a] Safety[a] Response to separation[a]	Parent Home visitor[c] Significant others Structured tasks
Early childhood	Home Surrogate care	Scaffolding Compliance[a]	Parent Home visitor Significant others Structured tasks
Childhood	Home School Surrogate care Neighborhood	Monitoring rules[a] School adaptation Unsupervised time with peers[a] Supervised activities[a]	Parent Home visitor Significant others Neighbors Teachers Child Peers Structured tasks
Adolescence	Home School Neighborhood Community	Exposure to "hot spots" Wandering Transit time Routine activities Communication and problemsolving	Parent Home visitor Significant others Neighbors Teachers Child Peers Structured tasks

[a]These are basic monitoring processes that may change form but carry forward through adolescence via the principle of hierarchical integration.

[b]Surrogate care is a dominant structuring strategy that varies in form with the development of the child, beginning with infant care, preschool, babysitting, and extended family care.

[c]Home visitor is a general strategy that relies on professional interviewers who render impressions.

When assessing parental monitoring, changes in the developmental status and the expanding ecologies of the child must be considered. The home setting is the first and primary context for assessment in early childhood. The beginning of school involves a qualitative shift in the nature of parental monitoring; school is the second universal context in which monitoring takes place. Monitoring becomes more distal, in that parents must track and structure to determine and influence the child's adaptation within school. Successful adaptation refers to both academic

and social success. This includes the child's attendance at school, acquisition of age-appropriate academic skills, the development of appropriate classroom behavior (e.g., listening to instructions, focusing on seatwork), and interactions with peers and teachers in various school-related settings (e.g., classroom, playground, school bus). Academic and social success are especially important to subsequent parental monitoring by establishing a developmental trajectory that is both salutary for the child and easier to monitor for the adults. Neighborhood activity and peer groups are also quite relevant to the child and adolescent. In fact, selection of antisocial friends from the neighborhood is a characteristic of antisocial youth, and therefore suggests that some neighborhoods are an especially important context for monitoring (Dishion et al. 1995; Wilson 1980). Finally, tracking and structuring the young person's involvement in community settings are relevant to late childhood and adolescence (Richters and Martinez 1993; Stoolmiller 1994).

The quest for increasing levels of independence and autonomy characterizes adolescence and challenges many parents whose strategies for monitoring served well during the early childhood years. Negotiation and problemsolving are critical communication skills in adolescence, as are basic listening skills (Forgatch 1989). Conflict during problemsolving discussions can lead to the "flight to peer" phenomenon, a bidirectional distancing process in which family conflict leads to the child spending more time with peers away from home (Elder 1980; Forgatch and Stoolmiller 1994). Good communication and problemsolving skills can serve to maintain the parent-adolescent relationship as well as refresh adult guidance in routine activities. As pointed out by Patterson and colleagues (1992), a history of failure in parenting is likely to undermine the parent-child relationship and reduce motivation for monitoring, which may be reflected in lax norms. What the parents do not know, they do not have to change. Furthermore, the more deviant the child, the more likely he or she will avoid attempts to monitor and will seek out settings where adults are absent (Stoolmiller 1994).

The development of parental monitoring from infancy through adolescence fits the principle of hierarchic integration. Experiences within the parent-child relationship build toward a parent-adolescent relationship within which monitoring practices are embedded. Trust, involvement, and shared activities are integral to monitoring.

Table 1 reveals that, in principle, many of the monitoring practices of infancy and early childhood carry forward to adolescence. Caretaking of the adolescent's needs is an important component of parental monitoring; however, the form and function change dramatically from infancy and childhood. For example, parents still need to attend to clothes, transportation needs, and the emotional well-being of the adolescent when caretaking. The ways in which this caretaking is carried out differ dramatically from when the adolescent was younger, with emphasis on increased responsibility of the adolescent and greater reciprocity between the parent and adolescent. Parent-child synchronicity has now evolved into parent-child communication processes, a critical feature of successful adaptation to the adolescent transition. Thus, there is a sense that parents are aware of the emotional atmosphere of the family and the child and modulate behavior, activities, and communication accordingly.

This discussion of the changing ecology of parental monitoring with development provides a basis for considering which measures to select at each age. However, there are important measurement issues that span developmental periods. Although the development of adequate measurement models and instruments concerning parental monitoring is in its infancy, some previous efforts (discussed below) highlight various measurement issues. These include the degree of specificity of parental monitoring items, reporting agents, observational measures of parental monitoring, and validity and reliability.

Specificity

Issues of specificity pertain to (1) the response format of the measure, (2) identification and assessment of specific risk situations, and (3) the extent to which the measure addresses parental monitoring practices or social cognitions.

Measures of parental monitoring have varied with respect to the response format that is employed. Many measures have utilized global reports on questionnaires; others have employed more behaviorally and temporally specific formats (e.g., "How often has this occurred in the past 24 hours?"). The Alabama Parenting Questionnaire (APQ) (Frick 1991) is a set of measures of parenting practices that has been developed for use with elementary school-age children 6 to 13 years old. The APQ consists of 42 items, 10 of which constitute a "Poor Monitoring/Supervision" scale. Items on the APQ are presented in both global report (i.e., questionnaire) and telephone interview formats, and there are separate versions of each

format for parents and children. Thus, there are four different versions of the APQ. The questionnaire format employs a five-point Likert-type frequency scale and asks the informant how frequently each of the various parenting practices typically occurs (e.g., never, always). Four telephone interviews are conducted, and the informant is asked to report the frequency with which each parenting practice has occurred over the previous 3 days.

Preliminary data concerning the psychometric properties of the APQ (with a sample primarily composed of clinic-referred children and their mothers) indicated that both parent report versions showed expected correlations with child age (i.e., poorer monitoring with older children), and neither appeared to be influenced by a social desirability response set (Shelton et al. 1996). The Poor Monitoring/Supervision scale of the parent questionnaire demonstrated adequate internal consistency (alpha = 0.67). However, the same scale on the parent telephone interview version lacked internal consistency (alpha = 0.21) and had low temporal stability (alpha = 0.66) across the four telephone interviews over a 2- to 4-week period. Shelton and colleagues (1996) suggested that the telephone interview format, which assessed occurrence of behaviors across a 3-day time window, may not be adequate for assessing the low base rate behaviors included in the Poor Monitoring/Supervision scale. However, others have successfully used 24-hour recalls on unsupervised time in parent and child telephone interviews (Dishion, Li, Spracklen, Brown, and Haas, this volume).

Additional research is needed to further examine the adequacy of more behaviorally specific response formats to resolve such discrepant findings. It may also be the case that the purpose of a particular research project may guide the selection of a particular response format (Shelton et al. 1996). For example, to be most useful for family-based intervention research, measures of parental monitoring may need to limit recall to a specific time period. Although more global recall periods may be less likely to be sensitive to change in response to such interventions, they may be preferable in descriptive or developmental research.

A second aspect of specificity has to do with the extent to which parental monitoring is assessed generally as opposed to particular risk situations or contexts. Developmental and ecological research can guide the measurement of monitoring toward identifying key risk situations. Research by Friedman and colleagues (1985) suggested that it was vital to assess monitoring routines among middle school youth immediately

after school and to determine whether the parent limited the youth's exposure to homes without supervising adults. Similarly, Richters and Martinez (1993) reported that, in their sample, many parents greatly underestimated their children's exposure to violence in the neighborhood. This lack of awareness of risk may inhibit adequate levels of monitoring.

Consideration of specificity also applies to whether the measure is assessing parental monitoring practices or social cognitions. Harris and McMahon (1998) are in the process of developing parallel instruments for the assessment of parental practices and values concerning monitoring. Preliminary analyses on a partial sample of mothers of 7th- to 12th-grade children show that the two constructs are moderately correlated ($r = 0.47$), suggesting that they are tapping somewhat different processes. As noted previously, injury-prevention researchers have often addressed issues related to the social-cognitive aspects of parental monitoring, such as parental attitudes and beliefs concerning appropriate levels of monitoring for children of different ages in different settings (Garling and Garling 1993; Peterson et al. 1993). The authors believe that it is essential that researchers make the distinction between parental monitoring practices and social cognitions, develop appropriate measures for each domain, and investigate the relationship between monitoring practices and social cognitions.

Reporting Agents

The most frequently employed sources of information concerning parental monitoring have been the parent (primarily the mother), the child, and home visitors/interviewers. Combinations of reports from multiple sources have also been employed as indices of parental monitoring (e.g., Crouter et al. 1990; Patterson and Dishion 1985). Parents are clearly the most appropriate source for information concerning the social-cognitive aspects of monitoring. However, the reliability, validity, and clinical utility of parent reports of monitoring practices are less clear, due to possible social desirability biases. It should be noted, however, that Shelton and associates (1996) failed to find evidence for such a bias on the Poor Monitoring/Supervision scale of the APQ.

The majority of the measures that have been used to study the relationship of parental monitoring to child problem behavior have utilized the youth's report of parent rules for structuring the youth's activities to ensure supervision. Child report of rules is obviously not an appropriate

measure of parental monitoring in infancy or early childhood, and some research suggests that reliance on the reports of elementary school-age children regarding parental monitoring practices may be ill advised (Shelton et al. 1996). Shelton and colleagues found evidence of a consistent response set bias on the child telephone interview format of the APQ (especially for 6- to 8-year-olds), and neither child version differentiated parenting practices of parents of children with disruptive behavior disorders (DBDs) from parenting practices of parents of children without DBD.

The use of other informants (e.g., interviewers, home visitors) or the combination of reports from multiple sources present other difficulties. Patterson and Dishion (1985) used interviewer impressions of supervision, child report of rules, and a parent-child difference score on deviant behavior to assess parental monitoring. Although promising empirically, these measurements are not conceptually pure. Interviewers' impressions may be subject to their own set of biases, in that they may be confounded with the deviance level of the child, where it is assumed, after witnessing the youth's report of drug and delinquent activities, that he or she is not well monitored. The parent-child difference score is also confounded with the deviance of the child, as children not engaging in problem behavior are more likely to agree with their parents' report of little problem behavior. The higher the degree of child problem behavior, the less likely the parent and child will agree on the exact level.

There are a number of collateral sources that may be considered for use in the assessment of parental monitoring. Teacher reports of the parents' awareness of the child's schoolwork and behavior have been shown to have convergent validity with other measures of monitoring (Dishion, Li, Spracklen, Brown, and Haas, this volume). Very few studies have relied on teachers' impressions as an auxiliary report on parental monitoring. One of the barriers to using significant others (spouse, extended family, family friend) is the heterogeneity of reporting agents, which may confuse results. The definition of families and the inclusion of caretakers has changed over time and varies across cultural and ethnic groupings. Joint-custody families, shared parenting with extended family members, and/or surrogate parenting strategies vary across families, and therefore become difficult to compare using a multiagent, multimethod strategy. Also underutilized are reports from the child's peers, as other children within the friendship network may be aware of the variation in parental monitoring across family homes.

Although the use of multiple reporting agents can produce both statistical and conceptual challenges, efforts to collect such data seem warranted. Information regarding overlapping perspectives (i.e., convergent validity) and predictive validity will guide new conceptualizations regarding parental monitoring as well as suggest alternative intervention and prevention targets.

Direct Observation

Developmental and clinical research has benefited enormously from direct observation of the parent-child interaction process. Direct observations are process oriented, specific, and sensitive to change. In infancy through early childhood, the processes identified as precursors to parental monitoring are easily observed in the home setting. However, direct observation of parental monitoring in childhood through adolescence is more challenging. The authors and their colleagues (Antony et al. 1996; Dishion et al., in press; Reid 1993) have developed observation protocols for older school-age children (i.e., from fifth grade on) that employ structured parent-child interactions. The procedure developed by Reid involves a brief (5 minute) discussion of the child's activities at school, whereas in Antony and colleagues' (1996) adaptation of this procedure the parent and child discuss a recent period in which the parent and child were separated. Of interest in these tasks is the parent's awareness of the child's activities and the parent's communication skills as they pertain to monitoring. The Dishion and colleagues (in press) protocol also prompts the child to describe a recent period when he or she was with peers without adults present. The child (ages 12 and up) describes, from beginning to end, where they were, what they were doing, and with whom. After the child describes this activity, the parent(s) can clarify or discuss the events. This procedure attempts to assess the monitoring process, which includes listening and gathering information as well as constructive and clear communication of rules and guidelines. Quasi-naturalistic tasks such as these provide a promising basis for direct observations of the parent-child processes underlying parental monitoring from childhood through adolescence. The long-term utility of these strategies, however, awaits empirical validation.

There are also a number of analogs that have been developed to assess parental tracking of child behavior on a moment-to-moment basis and to assess detection or labeling biases. Parents have typically responded to either written or videotaped vignettes and labeled child behaviors as

positive or negative as they occur (e.g., Holleran et al. 1982). The procedure developed by Wahler and Sansbury (1990) and by Sansbury and Wahler (1992), in which mothers rated videotaped interactions with their own children, seems especially promising.

Validity and Reliability

The previous discussion focused on the convergent and predictive validity of alternative reporting agents on parental monitoring practices. Intertwined with this discussion is the issue of reliability. Obviously, measures with low reliability will not be valid.

Dishion, Li, Spracklen, Brown, and Haas (this volume) looked at the retest stability of various indices of parental monitoring over a 3-month time interval, finding relatively high retest stability for interview assessments (test-retest correlations ranged from 0.68 to 0.70) and somewhat lower retest for telephone interviews (test-retest correlations ranged from 0.29 to 0.67). As noted previously, Shelton and colleagues (1996) reported a temporal stability coefficient of 0.66 across four telephone interviews for the Poor Monitoring/Supervision scale of the parent telephone interview version of the APQ. Telephone interviews provide a more discrete recall timeframe, so retest stability would be expected to be less. In the Dishion, Li, Spracklen, Brown, and Haas study (this volume), retest stability was quite low for coder impressions of monitoring ($r = 0.20$ to 0.26), primarily because the structured interaction tasks in this study did not elicit the parent-child interaction processes that would provide a solid basis for the staff to form impressions.

Another index of reliability is a measure of internal consistency such as Cronbach's (1951) alpha. Interview measures of monitoring to date have produced only moderate internal consistency. In the Dishion, Li, Spracklen, Brown, and Haas study (this volume), alpha coefficients were 0.67 for the child report and 0.61 for the parent's report, based on 8 and 12 items, respectively. Shelton and associates (1996) reported an alpha coefficient of only 0.21 for the Poor Monitoring/Supervision scale of the parent telephone interview version of the APQ.

Two strategies helped in increasing internal consistency indices of reliability: increasing the number and increasing the homogeneity of the items. It is the authors' impression that existing measurements of parental monitoring include both the tracking and structuring components of

monitoring. Thus, internal consistency might be improved by separating the structuring and tracking components. Similarly, separation of items assessing parental practices from those assessing social cognitions may have similar effects on internal consistency. Harris and McMahon (1998) found alphas of 0.88 and 0.80 for separate measures of parental monitoring practices and values, respectively.

PREVENTION IMPLICATIONS

The appeal of the parental monitoring construct is that it has broad implications for prevention programs that aim to benefit children. Not only is parental monitoring essential in preventing childhood maladaptation and injury, it is also the basis for positive socioemotional development such as children's self-esteem (Patterson et al. 1992). Research also suggests that parental monitoring may be associated with academic success in children (Crouter et al. 1990; Kurdek et al. 1995).

In the following sections, the authors discuss future directions in targeting parental monitoring practices in prevention and intervention programs. This discussion is organized around the definition of parental monitoring, beginning with motivation to monitor.

Motivation To Monitor

Positive parental beliefs about the value of parental monitoring are necessary, but not sufficient, for effective supervision to take place (Harris and McMahon 1998). Some cases of lax monitoring may be the result of a parent simply not believing that monitoring is necessary (i.e., a values issue) or diverse values regarding children's independence and autonomy. Many of these values may function implicitly, outside of parents' direct awareness, such as differential treatment of boys and girls (Fagot 1978).

Parent interventions often target parent motivation explicitly. One tactic is to share assessment findings with families in an effort to stimulate change at the onset of a parent training program (Sanders and Lawton 1993). Dishion and colleagues have developed the Family Check-Up, a systematic approach to promote change in parenting practices (Dishion, Kavanagh, and Kiesner, this volume). The approach builds on innovations devised by Miller and Rollnick (1991), in which concepts of motivational interviewing are used to change problem-drinking patterns in adults.

The Family Check-Up is a two- to three-session intervention. The first session includes an intense, structured, ecologically oriented assessment of the child and family using measures with normative comparisons. The second session, carefully conducted to build motivation to change, begins with the therapist asking for the parents' sense of the family. Then assessment findings are reviewed with the parent, using lay language and visual prompts whenever possible. The therapist continually reviews the appropriateness of the assessment findings with the parent. A full assessment battery is always administered (in contrast to a problem-focused assessment approach), to provide a basis for discussing strengths and weaknesses in the family. The therapist endeavors to support the parents' confidence to change and collaborates to set realistic individual goals. Finally, the feedback session is used to generate a list of change options that are based on the parents' sense of family resources and the therapist's expertise. The Family Check-Up may thus serve as one method for enhancing parental motivation to engage in more appropriate monitoring practices.

Motivation to monitor can be affected by the pattern of relationships and conflicts within a family. Triangulation is a systemic concept that is very relevant to the task of building parent motivation. A bad marriage can lead to strong, inappropriate coalitions between parents and their children that are secondary to marital conflict. A mother who is rendered ineffective in the face of a strong father-son coalition, for example, may lose motivation to monitor. In the same vein, the father may lose motivation to monitor due to his inappropriate investment in maintaining a "sibling relationship" with his son. In this way, a distressed marriage interferes with both parents' motivation to assume the functions of a healthy parent.

Systemically oriented family interventions focus on such issues that disrupt the parents' tendencies to exercise leadership in a family. These approaches to family therapy produce reductions in substance use among high-risk adolescents that are significant and lasting (Szapocznik et al. 1988) and have been associated with improvements in family interchanges (Liddle 1995). Given that motivation is embedded within the parent-child relationship, it is not difficult to make the connection between ongoing family conflict and the lack of motivation to monitor. In this sense, parental monitoring is a construct of relevance to all family-based approaches to prevention and intervention.

Parental motivation to monitor can also be the target of universal intervention strategies. Biglan (1995) discussed in detail communitywide interventions that addressed constituent childrearing practices. A universal intervention strategy that targets parents' motivation to monitor provides parents with community norms regarding children's unsupervised time. Such feedback can be given in school newsletters and homework assignments from school and through popular media such as radio and television. The media is potentially a very powerful tool for communicating norms and values regarding parental monitoring. Parents need to know that their attention and involvement are as necessary in the teenage years as in early childhood, a fact that seems to be neglected in popular renditions of the autonomous, rebellious teenager.

Parental Monitoring Skills

In some cases, ineffective parental monitoring may be due to a behavioral deficit (e.g., the parent does not know how to engage in effective monitoring practices even though he or she believes monitoring to be important). Other parents may display both cognitive and behavioral deficits vis-a-vis monitoring. There are clear implications for intervention, with problems in monitoring values and beliefs perhaps best addressed by cognitive-behavioral or educational interventions and problems with monitoring practices best addressed by a behavioral skills training approach.

Skills essential to parental monitoring vary with age. In infancy, reading signs of the baby's distress and discomfort are critical to the parents' ability to provide relief and comfort. In early childhood, behavior tracking becomes critical. Behaviorally oriented interventions at this age (see Dishion and Patterson, in press) provide parents with daily tracking exercises that involve the careful definition of key events. For example, many parents are reluctant to define a noncompliance as such in early childhood, and through frustration, berate children and pollute the family atmosphere through a process called "nattering." Developing tracking skills and redefining these key events is the critical step toward parents more effectively and constructively managing these normative events. When tracking skills are developed, parents may often be surprised that either the child is much more cooperative than they had thought or, conversely, that their child rarely cooperates with their requests.

Tracking and definition remain critical in intervention and prevention throughout adolescence. As the child matures, however, new monitoring skills are required. Interpersonal skills in communication with other

adults is an example. In interventions with parents, Dishion and colleagues (in press) used roleplay exercises (e.g., parents phone other parents to request information relevant to monitoring). Listening, along with other communication skills, is critical for parents to be aware of the life of their adolescent when he or she is away from home. Skill development is a strength of social learning-based interventions with families and is an important component of interventions that target parental monitoring.

Changing Ecologies

Interventions that target the ecology of the family may be the most far-reaching from a public health perspective (Biglan 1995). Two approaches can be considered from this perspective. The first is to design interventions that target the barriers to monitoring that directly impact parents. The second is to provide support systems that directly empower the parents' potential for accessing solid information about their children. An example of such a support system is telephone access to information regarding the child's attendance and school engagement (Dishion et al., in press).

Barriers interfere with parental monitoring regardless of motivation and skill level. Life stress (Forgatch 1989; Johnston 1996), poverty and unemployment (Elder et al. 1985; McLoyd 1990), extrafamilial insularity, and health problems (Wahler and Dumas 1984) can undermine parents' best intentions to monitor their children. An increased disparity between the rich and the poor in the United States suggests a double-edged sword for children. Changing economic and employment trends have measurable effects on the prevalence of problem behaviors secondary to disrupted parenting (Elder et al. 1985).

Even prosperity can have a toll on children's outcomes. Given that families work harder to achieve middle-class status, children raised in middle- to upper-class homes may be less monitored due to parent work schedules. Steinberg (1986) found increased risk associated with latchkey children. This "affluent neglect" could be targeted directly in prevention trials. Another level of prevention, however, is to address policies and customs that undermine monitoring and other parenting practices.

Another class of barriers to parental monitoring is the parents' own adjustment status (Wahler and Dumas 1989). Parent depression disrupts

synchronous parent-infant interactions (Zahn-Waxler et al. 1982) and monitoring practices later in development (Patterson et al. 1992). Parents' use of other drugs and alcohol disrupts monitoring practices (Dishion and Loeber 1985; Dishion et al. 1988). A parent's experiences of monitoring as a child can affect his or her own motivation to monitor; the antisocial parent is less likely to monitor (Patterson and Dishion 1988). Wahler and Sansbury (1990) have shown that mothers of clinic-referred children accurately identify positive child behaviors but underidentify negative child behaviors compared with trained observers. Furthermore, they found that this maternal bias in tracking negative child behavior was associated with a pattern of parent-child interaction in which the mother was more likely to give in to child noncompliance. In a similar vein, Patterson (1982) postulated that parents of children who steal may underidentify acts against property as deviant.

These data suggest that interventions that target the economic, social, and emotional ecology of the family may facilitate significant improvements in parental monitoring. A lifecycle view of prevention that goes beyond the individual child and family and spans time and contexts is clearly indicated.

Universal interventions that target school-family communication may be especially useful as a prevention strategy in early adolescence. Telephone lines that provide daily information regarding the academic performance, attendance, behavior, and homework completion of individual students would support parental attention to emerging difficulties (Reid 1993). Assessment of community and neighborhood hot spots and information to parents could prevent children from having contact with settings where substances can be used or purchased.

A more clinically focused study concerning family-school connections suggests that such an approach has promise (Bry and Canby 1986). These investigators provided direct support to parents for monitoring school progress and homework. The focus on school progress related to improvements in school, as well as decreases in substance use, suggested that increasing parents' monitoring in a specific area may produce generalized reductions in risk.

SUMMARY

Family-focused prevention that includes parental monitoring is a promising new direction relevant to the prevention of problem behavior and the promotion of the health and well-being of children. Existing research strongly supports this critical parenting practice as central to healthy parenting. The authors have defined parental monitoring as a complex set of social cognitions and behaviors that adjust to varying ecologies and the developmental status of the child. The goal of providing a clear definition and the discussion of the state of the art in measurement was to stimulate and guide future intervention research. The authors hope that through the iterative processes of science and action, prevention technology will grow to encompass interventions that directly support this parenting practice in conjunction with other critical dimensions of parenting.

NOTE

1. In June 1996, Dr. Rebecca Ashery of the National Institute on Drug Abuse organized a meeting of investigators working in the area of family research and interventions. The goal of this working group was to clarify issues of definition and measurement of parental monitoring. The definition and measurement sections in this chapter reflect these discussions.

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ACKNOWLEDGMENTS

This chapter was prepared with support from the National Institute on Drug Abuse Epidemiology and Prevention Group: James Anthony, Rebecca Ashery, William Bukoski, Howard Chilcoat, Linda Collins, Hyman Hops, Karol Kumpfer, Zili Sloboda, and Richard Spoth.

This project was supported by National Institute on Drug Abuse grant no. DA-07031 to Thomas J. Dishion, by National Institute of Mental Health grant no. MH-37940 to John Reid, and by National Institute of Mental Health grant no. MH 46690 to Gerald R. Patterson.

Correspondence regarding this research may be addressed to Thomas J. Dishion, Oregon Social Learning Center, 207 East Fifth Avenue, Suite 202, Eugene, OR 97401.

AUTHORS

Thomas J. Dishion, Ph.D.
Principal Investigator
Oregon Social Learning Center
207 East Fifth Avenue, Suite 202
Eugene, OR 97401

Robert J. McMahon, Ph.D.
Professor
Department of Psychology
University of Washington
Box 351525
Seattle, WA 98195-1525

Measurement of Parenting Practices in Research on Adolescent Problem Behavior: A Multimethod and Multitrait Analysis

Thomas J. Dishion, Fuzhong Li, Kathleen Spracklen, Gene Brown, and Eric Haas

MEASUREMENT STRATEGIES

One of the most perplexing issues in research on adolescent problem behavior is establishing the critical dimensions of parenting. What is it that parents do to establish, maintain, or alter the developmental course of their teenager? Careful examination of the measurement properties and validity of diverse approaches to conceptualization and assessment of parenting practices can be informative to intervention science as well as to the understanding of developmental processes. The focus of this study was to conduct a confirmatory factor analysis (CFA) of multiple measures of parenting practices within a sample of families with a high-risk, young adolescent (10 to 14 years old). The families were involved in a series of intervention studies conducted to reduce escalating trends in problem behavior (Andrews et al. 1995; Dishion and Andrews 1995; Dishion et al. 1996).

Parents' family management strategies (Patterson 1982; Patterson et al. 1992) and the affective connection between parent and child (described as either the attachment relationship or parent-child bond) are the two basic sets of variables that are most studied (Bowlby 1969; Elliott et al. 1985; Hirshi 1969). The family management perspective emphasizes the role of parenting practices in minimalizing coercive conflicting exchanges that contribute to antisocial and other problem behaviors. Researchers who emphasize relationship quality in children's development consider this relationship as crucial or prototypical to the adolescent's success in other relationships throughout the lifespan.

It is certainly possible to integrate multiple dimensions of influence into a more comprehensive view of the influence of parenting on child and

adolescent social development. Baumrind (1985) considers parenting to be conceptualized on two dimensions: warmth (relationship quality) and control (behavior management). Hawkins and colleagues (1986) and McCord (1991) view the parent-child bond as a separate but correlated feature of the family environment distinguishable from family management. The integration of family management and relationship theories appears to show promise in accounting for adolescent delinquent behavior in longitudinal studies. For example, McCord (1992) has reanalyzed the Cambridge-Sommerville data and found that both dimensions of parenting are prognostic of adolescent delinquency. This study is particularly important because measures of parenting were derived from coding many independent home visitors' impressions.

The developmental and clinical literatures do not necessarily present a coherent picture of the contribution of parents to adolescent substance use. Dishion and Loeber (1985) and Dishion and colleagues (1988) found that parental monitoring is the key factor in accounting for the young adolescent's drift into a deviant peer group as well as early involvement with substance use. A program of research conducted by Conger and colleagues (1992) suggests that poor parent-child relationships and family disruption may be uniquely predictive of substance use in adolescence. Structural and strategic family therapists emphasize the systemic nature of family transactions with respect to the young adolescent's problem behavior (Stanton and Todd 1982; Szapocnik and Kurtines 1989). For example, the drug-using child (being the youngest or only child in a family) is perhaps too close to parents (i.e., enmeshed), which interferes with the parent's ability to set limits and/or monitor their child's behavior. Another systemic theme is the triangulated relationship process, where the child fills a special niche in the lives of parents living in marital distress. Thus, a child may be protected by the mother and punished too severely by the father as a function of the child's position and coalition with respect to the two parents.

It is the authors' position that the systemic view of families is useful for understanding the emotional underpinnings of the compromised parent-child relationships as well as the parent's performance of family management practices. Understanding systemic patterns also provides the details necessary to effectively intervene to reduce or prevent adolescent problem behavior. The authors suggest that all family-based intervention models require a set of constructs and a model that delineates developmental processes leading to adolescent problem

behavior and serves as an intervention target. A useful step in this process is to conduct construct validation studies that clarify the interrelation among parenting constructs in addition to measurement issues that affect their predictive validity.

Building on the work of Patterson and colleagues (1992), the authors collected measures from child, parent, and staff impressions on five family management constructs: limit setting, monitoring, problemsolving, positive reinforcement, and relationship quality. A significant advancement in research on parenting practices is the use of multitrait-multimethod data. By combining measures one can reduce the fallibility of any individual strategy and avoid the possibility of monomethod bias (Cook and Campbell 1979; Dwyer 1983). The authors used a multitrait-multimethod (MTMM) measurement strategy to address construct validation questions: To what extent are these parenting constructs intercorrelated and at what level? The level of correlation among the parenting trait constructs speaks to the issue of whether these practices are part of a general parenting style or reflect distinct dimensions. To what extent does the measurement method (i.e., reporting agent) account for covariation among the observed data?

Bank and colleagues (1990) discuss the issue of method problem in the context of structural equation modeling. A method problem exists when the most highly correlated indicators within a model are those derived from the same measurement method. In an MMTM analysis, method constructs can be operationalized and studied along with parenting trait constructs. CFA is a powerful statistical protocol for addressing these questions. In the context of structural equation modeling, competing models (e.g., trait versus method) can be compared using indices of model fit as well as differences in the chi-square goodness-of-fit test (Bentler and Bonett 1980).

The parenting constructs (trait or method) were also evaluated with respect to criterion and predictive validity. In this analysis, measures of criterion and predictive validity were objective and independent of the measures used to define the parenting constructs. Direct observations of parent-child negative exchanges form a valid criterion measure of parenting relevant to the coercion model of the development of adolescent problem behavior (Patterson 1982; Patterson et al. 1992), as well as serving as a target of change in parenting interventions (Dishion and Andrews 1995; McMahon and Peters 1990; Patterson 1974; Webster-Stratton and Hammond 1990). Official school and police

records of the youth's conflicts with authority in the 2-year period after the initial assessment were used as an index of problem behavior.

METHOD

Participants

The participants used in this analysis were recruited for the Adolescent Transitions Program, an intervention designed to help prevent adolescent alcohol and other drug use. Participants were recruited in seven cohorts over a 4-year time period, from 1988 to 1992. All participants in the study were considered at risk. Cohorts 1 through 5 were referred by parents and were in grades 6, 7, and 8. Cohorts 6 and 7 were recruited through the schools and were all in grade 7. Baseline data for all participants were combined in the models tested.

The 224 participants included 111 boys and 113 girls. At baseline they ranged in age from 10 to 14 years old, with an average age of 12.2 years. The family status of the participants included 42.9 percent from single-family households (mostly single mothers), 36.2 percent from two-parent families where one of the parents was a stepparent, and 21 percent from intact two-parent families. The families tended to be economically disadvantaged, with 48.2 percent receiving some sort of financial aid. Sixty percent of the families had a gross annual income under $20,000. Eighty percent of the mothers and 74 percent of the fathers had completed high school. For both mothers and fathers, 17 percent had graduated from college. All participants resided in a moderate-size northwestern city. The participants were predominantly (90 percent) European American. Assessment data included questionnaires, interviews, telephone interviews, videotaped observations, and official records.

Procedures

Interviews and Questionnaires. Prior to the start of treatment (baseline) and again shortly after completion of treatment (termination), the teens and their parents were interviewed separately. The interviews lasted approximately 45 minutes, and afterward the interviewer was asked to fill out an impressions form containing 25 questions covering a broad range of characteristics ranging from rating the child's social skills to how likely it would be for the child to get into trouble with the police.

Prior to the interview, the parent (or parents) and child were asked to complete several questionnaires. Questionnaires were also sent to the child's teacher, including the Peer Involvement and Social Skill Questionnaire (Walker and McConnell 1988) and the Teacher Child Behavior Checklist (Achenbach 1991).

Observations. At baseline and again at termination, the child and parents were videotaped in a 25-minute family interaction task. Before the lab task began, the parents and child were presented with a list of possible discussion topics and asked to rate how "hot" the topic was. The lab task comprised a 5-minute warmup session where the family was asked to plan an activity that they could do together in the coming week, followed by two 10-minute sessions where the family discussed a problem identified by the child as "hottest" and one identified as "hottest" by the parents. Parent and child problems were taken in random order.

The session was coded using the Family Process Code (FPC) (Dishion et al. 1983) and the Pencil and Paper Code (PEN-P) (Dishion and Soberman 1994). The FPC is a microsocial coding system that records family interaction in real time, capturing the interpersonal content and affective valence of the discussion. Twenty percent of the videotapes were coded by two observers. Reliability between the two observers was determined by comparing the moment-by-moment entries using a 6-second "window of agreement." There was 86.4 percent agreement on the content of the code (basic code category) and 73.4 percent agreement on affective valence. Percent agreement on content and affect codes ranged from 0.37 to 0.91 across different observers. An overall weighted kappa of 0.69 was found on the combined content and valence of each entry, with kappa scores ranging from 0.37 to 0.78 (Cohen 1955).

The PEN-P system uses 1-minute intervals to measure negative and positive exchanges, as well as the rate of negative engagement between the interactants. Two types of exchanges, directed (to an individual) and undirected (not to an individual), were coded.

Coder Impressions. FPC coders were asked to complete a 27-item questionnaire regarding the outcome of the problemsolving: clarity of problem definition, extent of resolution of the problem, quality of solutions, personality variables of the interactants, the parents' skill in

discipline confrontations, as well as their involvement with the child and positive reinforcement practices (Forgatch et al. 1985).

PEN-P coders were also asked to give impressions of family variables including endorsement of deviant norms, family management style, relationship quality, problemsolving resolution, and emotional control.

Telephone Interviews. At baseline, termination, and at yearly followup intervals, the parents and teens were contacted by telephone for a series of six brief interviews, conducted at 3-day intervals. An attempt was made to conduct both the parent and the child telephone interviews on the same day whenever possible. The telephone interview included an assessment of the child's involvement in substance use, deviant peer groups, and other delinquent behaviors, as well his or her impressions of the parents' monitoring and discipline practices.

Official Records. Adult and juvenile court records were retrieved from the court system by Oregon Social Learning Center (OSLC) staff members. School records assessment included standard test scores, transcripts of grades, attendance, and discipline contacts. Records were also kept of out-of-home placements to juvenile corrections facilities, group homes, and special schools for children with problem behavior.

Construct Formation. The formation of constructs was hypothesis driven. Items from the interviews and from staff impressions were generated to measure constructs within a general model of antisocial behavior (Patterson et al. 1992). Items with measures were related to constructs on an a priori basis. In the present analysis, the measurement method refers to reporting agent. Table 1 includes an identification of the construct, the reporting agent, the instrument used, and 3-month retest stability. All constructs were formed from data collected prior to the start of treatment. Three-month retest stability scores were formed by correlating baseline measurements with like measurements taken shortly after termination.

CONSTRUCT DEFINITIONS

Monitoring

The definition of this construct relies on measures used in previous studies (Patterson and Dishion 1985). Parent monitoring involves

TABLE 1. *Family management constructs: Composition and 3-month retest stability.*

	Monitoring			Limit Setting			Relationship Quality			Positive Reinforcement			Problemsolving		
	N	α	Stability	N	α	Stability	N	α	Stability	N	α	Stability	N	α	Stability
Total construct			0.70‡			0.54‡			0.67‡			0.51‡			0.47‡
Total child report			0.63‡			0.47‡			0.61‡			0.47‡	5	0.87n	0.46‡
Child interview	8	0.68	0.68‡	--	--	0.47‡	--	--	0.49‡	--	--	0.40‡			
Child daily report	--	--	0.48‡	--	--	0.33‡	--	--	0.67‡	--	--	0.40‡			
Total parent report			0.51‡			0.64‡			0.63‡			0.59‡	7	0.79mn	0.43‡
Parent interview	13	0.81m	0.70‡	11	0.81m	0.65‡	5	0.85m	0.65‡	--	--	0.57‡			
Parent daily report	5	0.38	0.42‡	--	--	0.29‡	--	--	0.60‡	--	--	0.42‡			
Family activities report							28	c	0.48‡						
Total staff impressions			0.33‡			0.15‡			0.43‡			0.35‡			0.43‡
FPC coder impressions			0.20‡	5	0.73	0.15*	5	0.86m	0.22†	--	--	0.31‡	--	--	0.32‡
PEN-P coder impressions			0.26‡	--	--	0.32‡	5	0.86m	0.38‡	--	--	0.20†	8	0.86	0.32‡

NOTE: Dashes indicate the scales consisting of fewer than five items were not reported; m = values for the mother responses; n = separate alphas computed for the parent and child problems; c = scale was formed as a count of the number of items enclosed.

*$p < 0.05$
†$p < 0.01$
‡$p < 0.001$

ensuring that the child is in settings that are supervised by adults, articulation and enforcement of rules that track the child's whereabouts (e.g., knowing the phone number of friends where the child is visiting), and professional impressions of the parent's supervision of the child.

Child Report. This score is made up of the child's report from a personal interview and a series of telephone interviews that were conducted six separate times. In the interview the child was asked, "Do your parents know if you play with kids who get into trouble?", "Do your parents let you go anywhere without asking?", "How often do you tell your parents when you will return?", and "How often do you leave a note for your parents?" In the telephone interview the child was asked, "How much time have you spent with your parents in the previous 24 hours?" and "How often do you talk with your parents about what you have done or are going to do?"

Parent Report. This score consists of the parent's report from a personal interview and a telephone interview conducted six separate times, covering the previous 24 hours. In the personal interview the parent was asked, "How often does your child go to forbidden places?", "How difficult is it to know where your child is?", "How often is there adult supervision when your child is away from home?", "How often is your child home by the set time?", and "How often is your child at a friend's house when they say they will be?" In the telephone interview the parent was asked, "How much time have you spent with your child in the previous 24 hours?" and whether or not the child was out after 7:00 p.m. without an adult.

Staff Impressions. This score includes two separate impression inventories. Staff members using the FPC were asked to rate how well the parent (or parents) seemed to monitor the child. FPC intercoder reliability was 0.55, $p < 0.001$. Staff members using the PEN-P were asked to rate how well informed the parents were about their child's whereabouts and whether the parents avoided intervening with the child. The intercorrelation between two raters was 0.38, $p < 0.05$.

Limit Setting

This construct (referred to as discipline in previous research; Patterson 1982; Patterson et al. 1984, 1992) has been expanded to include the parents' tendency to articulate clear and consistent rules. Skillful limit setting is firm, consistent, nonabusive, and used sparingly.

Child Report. The child's report from the personal interview asked, "How often do your parents punish you after threatening punishment?", "How often can you get out of your parents' punishment?", "How often do your parents agree on punishment?", and "How often do your parents punish fairly?"

Parent Report. This report from the personal interview assessed limit-setting skills: "How often do you follow through on punishment?", "How often does your punishment depend on mood?", and "How often can your child get out of a punishment?"

Staff Impressions. After coding the family's videotaped interaction using the FPC, staff members rated the parents' limit-setting abilities: "Did the parent (or parents) use ineffective discipline?", "Did the parent seem to lack parental discipline?", and "Did the parent give rationales?" FPC intercoder reliability was 0.61, $p < 0.001$. The two relevant questions from the PEN-P coder impressions, "Mom/Dad suggested ability to set limits" and "Mom/Dad suggested use of punitive limit setting," were dropped due to poor correlation with other limit-setting items.

Relationship Quality

The quality of the parent-child relationship in early adolescence reflects three theoretical dimensions: the extent to which the parent and child are positive with one another when discussing family issues, the extent to which the parent and child are involved in one another's lives in terms of shared activities, and the sense of mutual acceptance and lack of rejection.

Child Report. This score included the child's report from the personal interview and the telephone interview. In the personal interview the child was asked, "How well do you get along with each of your parents?" In the telephone interview the child was asked, "Do your parents hug, kiss, or show affection to you?"

Parent Report. This score included the parent's report from the personal interview, the telephone interview, and the Family Activities Checklist (1984). This checklist contains 28 activities that previous groups of OSLC-study parents and children have identified as pleasurable events (e.g., go to a movie together). Parents were asked to indicate whether any of the activities occurred within the last week. In

the personal interview the parent was asked, "How easy is it to spend time with your child?" and "How difficult is it to be patient with your child?" In the telephone interview the parent was asked, "How often do you hug, kiss, or show affection to your child?"

Staff Report. After coding the family's videotaped interaction using the FPC, staff members were asked to rate the relationship each parent had with the child, how often each parent engaged in various behaviors with the child (e.g., "How often was Mom/Dad verbally affectionate with child?", "How often was Mom/Dad hostile to child?"), and how often the child engaged in various behaviors with each parent (e.g., "How often was the child friendly to Mom/Dad?", "How often did the child seem detached from Mom/Dad?"). FPC intercoder reliability was 0.69, $p < 0.001$. Staff members using the PEN-P were also asked, "How often did Mom/Dad/child show expressions of affections?", "How often did Mom/Dad/child use humor to lighten the situation?", and "How much does each family member enjoy spending time with the family?" The correlation among PEN-P coders was 0.66, $p < 0.001$.

Problemsolving

This construct reflects the parent's skill in actively resolving points of conflict or other family problems. The construct was first specified in Patterson's (1982) discussion of family management. Research by Forgatch (1989) studied the problemsolving process in detail, finding that expressed negative emotion disrupted problemsolving discussions and outcomes.

Child Report. After a structured problemsolving task where the family was asked to solve a problem that the parent (or parents) chose and one that the child chose, the child was asked, "How well did you understand the problem?", "Do you think the problem was solved during the discussion?", and "How satisfied are you with the discussion?"

Parent Report. After the structured problemsolving task, the parents were asked, "How much did you agree on a solution?" and "Did the family decide to take some action?"

Staff Report. After coding the structured problemsolving task using the FPC, staff members were asked to rate how much each parent provoked the child to argue. FPC intercoder reliability was 0.64, $p < 0.001$. Staff members using the PEN-P were asked to rate how much of an emotional

topic the problem was for the family and how well the family solved the problem (e.g., "What was the quality of the proposed solution?", "How likely is the family to follow through with the proposed solution?", and "Did the family discuss the advantages and disadvantages of the proposed solution?"). PEN-P intercoder reliability was 0.52, $p < 0.001$.

Positive Reinforcement

This construct reflects the parents' skill in praising or complimenting their child as well as their use of giving extra privileges for desired behaviors.

Child Report. In the personal interview the child was asked, "How often does your parent reward or praise you daily?" and "How often is your parent hard to please?" In the telephone interview the child was asked, "Did your parent praise or compliment you in the previous 24 hours?" and "Did your parent give you extra privileges?"

Parent Report. In the personal interview the parent was asked, "How often did you praise your child for a good job?" and "How often did you give something extra because you were pleased with your child?" In the telephone interview the parent was asked, "Did you praise or compliment your child in the previous 24 hours?" and "Did you give something extra to your child in the previous 24 hours?"

Staff Report. After coding the family's videotaped interaction using the FPC, staff members were asked to rate each parent on whether they used sarcasm and whether or not they were positive and reinforcing. FPC intercoder reliability was 0.62, $p < 0.001$. PEN-P coders were asked to rate each parent on whether they suggested using a social learning strategy for behavior management and whether they suggested behavior management strategies that were hard to carry out. The correlation among PEN-P coders was not significant at 0.27.

Observed Family Coercion

This construct reflects the amount of conflict or unpleasantness within the family. It comprises the rate-per-minute score of negative engagement from the observations by staff members using the FPC and the total number of negative engagements using the PEN-P. Negative engagements were considered to be interactions that were negative by their very nature (e.g., hitting, insulting) or interactions that were carried

out in an aversive affect. The score was based on mother-to-child negative engagements and child-to-parent negative engagements. The correlation between the negative engagement scores derived from the FPC and PEN-P was 0.56. Observation data used in this study were taken prior to the start of treatment.

Authority Conflict

This construct indicated how often the child was disciplined at school or had contact with police for problem behavior in the 2 years after intervention. It was measured using three scores created from public records. First, from juvenile court records, the number of offenses were counted and split into four scores: 0 = no offenses, 1 = one offense, 2 = two offenses, and 3 = three or more offenses. Second, the child's school status was defined: 0 = in public school, 1 = in a special school because of behavioral problems or court mandate, and 2 = dropped out or expelled from school. Third, from school records a score was created based on the number of discipline contacts the student received: 0 = no discipline contacts, 1 = below the 50th percentile of those receiving discipline contacts, 2 = between the 50th and 75th percentiles, and 3 = above the 75th percentile. The three scores were then added together to create the Authority Conflict score.

ANALYSIS STRATEGY

In analyzing this MTMM dataset, the authors followed the recommendations of Bagozzi and Marsh (Bagozzi 1993; Marsh and Grayson 1995). The Structural Equations Program (EQS) (Bentler 1989) was used to test four nested factor models: (1) the least plausible model is the null model (M_0), specifying that all measures were mutually uncorrelated; (2) the trait model (M_1), suggesting that covariation among measures is accounted for by four correlated parenting traits; (3) the methods model (M_2), indicating that the factors associated with the reporting agent accounted for the majority of the covariation within these data; and (4) the "relativism" model (M_3), stating that both measurement method and parenting traits accounted for covariation among those data.

The models were evaluated with three fit indices: traditional chi-square goodness-of-fit, the Tucker-Lewis Index (TLI) (Tucker and Lewis 1973), and the Comparative Fit Index (CFI) (Bentler 1990). The authors followed Marsh's (1989) guidelines when running and evaluating the

models: obtaining a well-defined solution (i.e., a proper converged solution, permissible parameter estimates), considering the theoretical justification parameter estimates, and examining test statistics and goodness-of-fit indices of a model with those obtained through alternative model comparisons.

After testing the four nested models of the data, the authors examined the relative proportion of variance in the indicators that were accounted for by method and construct variance. In addition, the validity of the parenting method constructs was tested with respect to observed family coercion (criterion validity) and subsequent adolescent conflicts with authority (predictive validity).

RESULTS

Originally, 15 indicators represented the five parenting constructs. Inspection of the correlation matrix and initial confirmatory factor analyses revealed that the Limit Setting construct was not empirically supported.[1] Dropping this construct rendered a 12 x 12 correlation matrix, shown in table 2. Using the terms defined by Campbell and Fiske (1959), the MTMM matrix comprised three types of correlations: first, the monotrait-heteromethod (MTHM) correlations, describing the correlation among measures of the same trait using different methods (i.e., convergent validity). Second, heterotrait-heteromethod (HTHM) correlations, including measures of different traits assessed by different methods. Third, heterotrait-monomethod (HTMM) correlations represented correlation among measures of different traits assessed by the same method.

Campbell and Fiske (1959) provided criteria for evaluating convergent and discriminant validity. Evidence of convergent validity is obtained if the MTHM correlations are large and significantly greater than zero. Discriminant validity is indicated if the MTHM correlations are significantly greater than the HTHM correlations, the MTHM convergent validities are higher than HTMM correlations, and the pattern of correlations using different traits is similar for different methods.

TABLE 2. *Person product-moment correlations among measures of parenting practices (N = 220).*

Trait Measured	1	2	3	4	5	6	7	8	9	10	11	12
Monitoring												
Child	1.00											
Parent	0.34	1.00										
Staff	0.31	0.34	1.00									
Relationship quality												
Child	0.37	0.26	0.27	1.00								
Parent	0.30	0.54	0.22	0.39	1.00							
Staff	0.20	0.29	0.47	0.39	0.34	1.00						
Problemsolving												
Child	0.24	0.14	0.25	0.40	0.15	0.38	1.00					
Parent	0.16	0.15	0.31	0.32	0.27	0.35	0.67	1.00				
Staff	0.15	0.20	0.40	0.28	0.27	0.67	0.39	0.44	1.00			
Positive reinforcement												
Child	0.42	0.21	0.15	0.50	0.21	0.19	0.16	0.14	0.04	1.00		
Parent	0.08	0.25	0.12	0.08	0.36	0.14	0.11	0.14	0.09	0.26	1.00	
Staff	0.11	0.27	0.49	0.19	0.24	0.67	0.28	0.29	0.65	0.06	0.15	1.00

Examining the convergent validities in table 2, all correlations but one were moderate in size (ranging from 0.06 to 0.67 with a mean of 0.34) and statistically significant (p value ranging from 0.03 to 0.001). In general, the data were consistent with moderate levels of convergent validity.

The first step in examining discriminant validity was to compare the convergent validities with those correlations that did not share method or trait (HTHM). At the very least, measures of the same trait should correlate higher than those that measure neither the same trait nor method.

Consistent with Bagozzi and Yi (1990) and Byrne and Goffin (1993), the authors used an a priori value to determine the degree to which discriminant validity was achieved: Less than 5 percent of the comparisons of violated expectations would reflect a high degree of discrimant validity, less than 30 percent of violated expectations represented moderate, and greater than 30 percent represented a low level of discriminant validity. On the basis of these guidelines, the authors found moderate support for discriminant validity (i.e., 14 percent of violations in 10 out of 72 comparisons, convergent validities were higher than HTHM values). Violations were primarily due to child-staff and parent-staff measures.

The second step in determining discriminant validity concerns the issue of method effects. Of the 72 comparisons, 13 were found to have violated the Campbell-Fiske criterion. Thus moderate support for the discriminant validity of the 12 indicators was found using the a priori criterion described previously (i.e., 18 percent violations in 13 out of 72 comparisons). Again, violations were primarily due to child-staff and parent-staff measures.

In summary, evaluation of the MTMM matrix based upon the Campbell-Fiske (Campbell and Fiske 1959) criterion appeared to lend moderate support for discriminant and convergent validity for both the method and trait constructs. Reliance on observed correlations, however, provided an imprecise and potentially misleading basis for assessing construct validity. An observed correlation will reflect random error and method effects in addition to the true association among measures of traits. The Campbell-Fiske procedure provided no concrete information as to the separate amounts of variation in measures due to traits, methods, and random error. For this reason the authors used structural equation

modeling to disentangle trait, method, and uniqueness in this set of 12 measures of parenting.

MTMM Confirmatory Factor Analysis

Maximum likelihood estimation assumes that the data being analyzed are multivariate normal. As a preliminary step, the distributional properties of the 12 indicators used in the MTMM analysis were examined (see figure 1). Skewness and kurtosis measures suggested that the marginal distributions of the data set were normal; skewness values averaged 0.35, with a range of –0.53 to 0.16, and kurtosis values averaged 0.27 (absolute value), with a range of –0.53 to 0.14.

The tests of the four models are presented in table 3 along with the goodness-of-fit indices (chi-square statistic, TLI, CFI) that were derived from comparing the model-generated covariation coefficients with the observed covariation among the 12 indicators.[2] Because ill-defined solutions occur frequently in the CFA application to MTMM analysis, it is recommended that researchers place their emphasis only on those models that result in proper solutions (Bagozzi 1993; Marsh 1989; Marsh and Grayson 1995). In these analyses, all four models resulted in proper, identified solutions.

Examination of the models' goodness-of-fit indicated that all models were superior in fit to the null model (M_0). However, both M_1, in which no method effects were hypothesized, and M_2, in which no traits were specified, fit the data poorly. The lack of fit in M_1 and M_2 indicated that model mispecification resulted from the elimination of either trait or method effects and suggested the need to consider modeling both effects (trait and method) simultaneously. As can be seen in table 3, M_3 provided an improved fit to the data over all previous models. Thus, the specifications of both method and trait effects provided the best account of the observed covariation among these of parenting practices.

The standardized loadings for each method and trait construct based on M_3 are shown in table 4. Convergent validity is reflected in the magnitude of the trait loadings. Although most of them were small in size (M = 0.41), all loadings on the parenting trait factors were statistically reliable. This constitutes evidence of convergent validity in the sense that different methods measuring the same trait appear to converge. Note, however, that the magnitude of the loadings varied considerably across parenting constructs. For instance, loadings on the

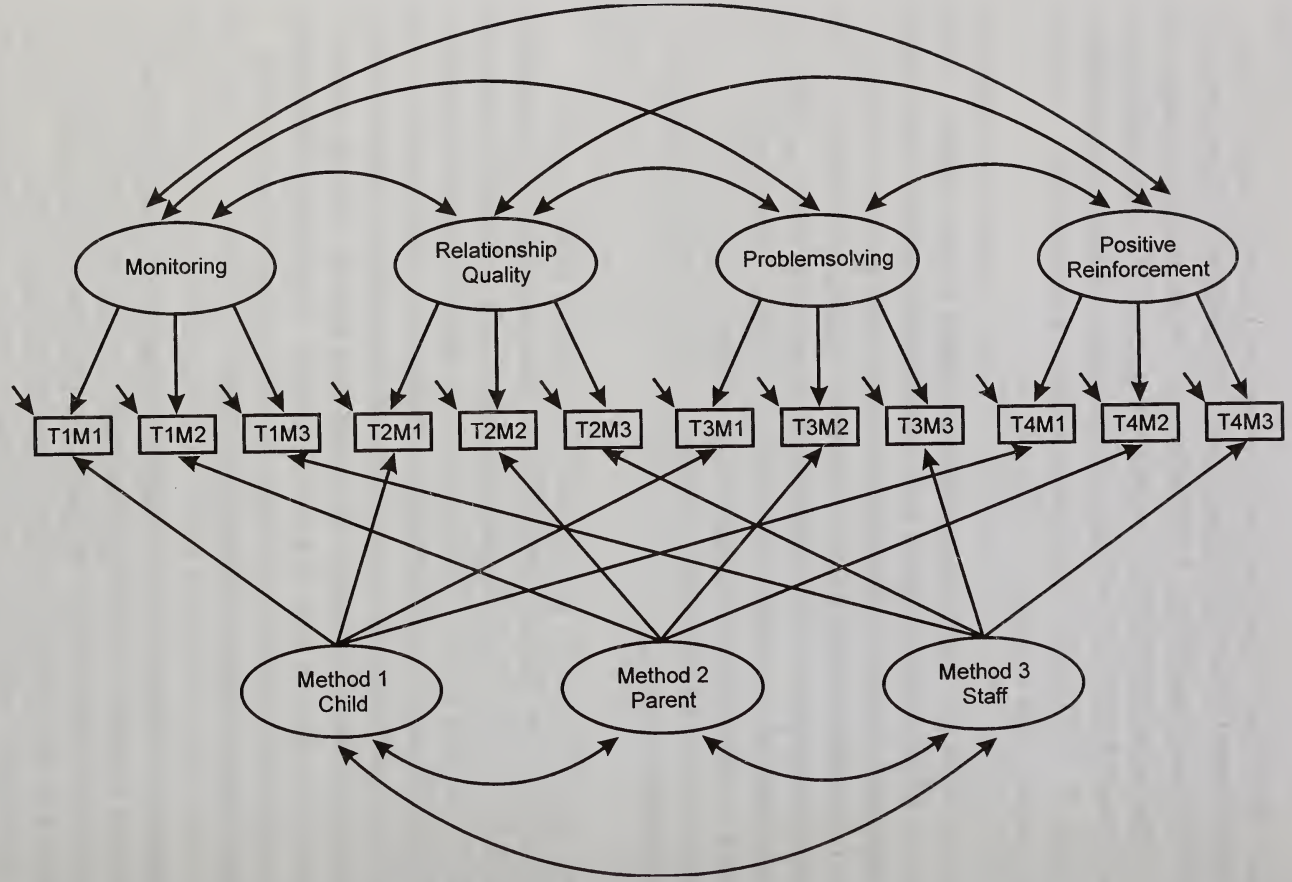

FIGURE 1. *The CFA-MTMM model of correlated traits and correlated methods for parenting practices.*

TABLE 3. *Summary of goodness-of-fit indices for MTMM model of parenting practices.*

Model Tests	χ^2	df	TLI	CFI
0. Null model (M_0)	979.28	66	-	-
1. Four correlated traits; No methods (M_1)	368.92	48	0.52	0.65
2. Four correlated methods; No traits (M_2)	260.64	51	0.70	0.77
3. Four correlated traits; Three correlated methods (M_3)	62.51	33	0.94	0.97

KEY: TLI = Tucker-Lewis Index (Tucker and Lewis 1973);
CFI = Comparative Fit Index (Bentler 1990)

Problemsolving factor were shown to be the highest in size (M = 0.71), whereas loadings on the positive reinforcement factor were the lowest (M = 0.31).

Loadings on the method factors were also quite large (M = 0.50) and statistically significant. High loadings on the method factors suggest that unique aspects of the reporting perspectives of the child, parent, and staff were an important source of covariation in these data. It is not surprising that method effects were minimal on the problemsolving construct, where the trait loadings were relatively high.

When discussing the magnitude of method and trait effects within each indicator, it is important to consider the proportion of variance accounted for. The proportion of variance of an indicator accounted for by a trait or method factor is equal to the square of the standardized factor loading. These partitioned variances are summarized in table 5.

Inspection of the proportion of variance in each indicator accounted for by trait and method variance indicated a mixed pattern. The trait variance, in general, was small. The method variance exceeded that of trait variance for 8 of the 12 variables. Consistent with the analyses at the matrix level, large method variances were observed for parent report

TABLE 4. *Trait and method loadings for MTMM Model.*

Measurement Procedure	MO	RQ	PS	PR	CR	PR	SI
Child report (CR)							
Monitoring (MO)	0.44				0.45		
Relationship quality (RQ)		0.58			0.54		
Problemsolving (PS)			0.83		0.07		
Positive reinforcement (PR)				0.28	0.71		
Parent report (PR)							
Monitoring (MO)	0.43					0.55	
Relationship quality (RQ)		0.35				0.81	
Problemsolving (PS)			0.81			0.11	
Positive reinforcement (PR)				0.20		0.40	
Staff impression (SI)							
Monitoring (MO)	0.69						0.33
Relationship quality (RQ)		0.55					0.66
Problemsolving (PS)			0.49				0.67
Positive reinforcement (PR)				0.45			0.74

and staff impression. It can be seen that all three measurement procedures showed a considerable amount of uniqueness (i.e., variance that was not explained by either the trait or method factors). These results suggest that both method and uniqueness within each indicator combine to attenuate the level of variation within each indicator, which can be attributed to the parenting traits.

Discriminant validity can be evaluated by inspection of the correlations among the trait and method latent factor scores. Conceptually, correlations among traits should be negligible to satisfy evidence of discriminant validity. Inspection of table 6 reveals that correlations among the traits were all significant and moderately high (M = 0.66), with the highest correlation between positive reinforcement and relationship quality ($r = 0.76$). In contrast, correlations among method factors were small in size (M = 0.22), suggesting independence among the parenting perspectives of the child, parent, and staff. The standardized factor correlation between child and parent reports (0.36) and between parent and staff reports (0.28) was relatively low.

TABLE 5. *Variance components due to trait, method, and uniqueness for MTMM Model.*

Measurement Procedure	Trait	Method	Uniqueness
Child report			
Monitoring	0.19	0.20	0.61
Relationship quality	0.34	0.29	0.37
Problemsolving	0.69	0.00	0.31
Positive reinforcement	0.08	0.50	0.42
Parent report			
Monitoring	0.18	0.30	0.48
Relationship quality	0.12	0.66	0.78
Problemsolving	0.66	0.01	0.67
Positive reinforcement	0.04	0.16	0.80
Staff impression			
Monitoring	0.48	0.11	0.41
Relationship quality	0.30	0.44	0.26
Problemsolving	0.24	0.45	0.31
Positive reinforcement	0.20	0.55	0.25

TABLE 6. *Trait and method correlations for MTMM model.*

Measures	Parenting Traits				Methods		
	MO	RQ	PS	PR	CR	PR	SI
1. MO	1.00						
2. RQ	0.63	1.00					
3. PS	0.47	0.76	1.00				
4. PR	0.73	0.68	0.70	1.00			
5. CR					1.00		
6. PR					0.36	1.00	
7. SI					0.03	0.28	1.00

KEY: MO = monitoring; RQ = relationship quality; PS = problemsolving; PR = positive reinforcement; CR = child report; PR = parenting report; SI = staff impression.

External Validity. The external validity model (M_4) was a simple extension of M_3, with the inclusion of two objectively measured external variables (authority conflict and observed family coercion). In the

M_4 model, each trait and method was allowed to covary with the two external variables. Because of incomplete data in the external variables, the authors utilized EQS multisample procedures to test the assumption that the pattern of missingness is random (Little and Rubin 1987). Detailed procedures for testing missingness hypotheses appear in the appendix.

The model relating the parenting constructs to external criteria resulted in a proper solution and provided a good fit to the data, c2 (133, N = 220) = 170.71, NNFI (Nonnormed Fit Index) = 0.96, CFI = 0.96. At this juncture, the central concern was the extent of criterion and predictive validity to measures of authority conflicts during the 2 years following treatment.

Expectations regarding the external validity of the parenting traits from the M_4 model were, in general, found tenable (table 7). Three correlations specifying relationships between the parenting constructs and the external validity criteria were found to be statistically significant. Results showed that monitoring was negatively related to family coercion and authority conflict, indicating that high levels of parental monitoring were associated with low levels of family coercive behavior and conflicts with authority.

TABLE 7. *Correlations among parenting practices and external validity factors of adolescent problem behavior.*

Model	Family Coercion	Authority Conflict	Carbon Monoxide
Trait Effect (M_4)	-0.35*	-0.32*	-0.25*
Monitoring	-0.56*	-0.13	-0.15*
Relationship quality	-0.43*	0.03	-0.05
Problemsolving	-0.42*	-0.09	-0.04
Positive reinforcement			
Method effect (M_5)			
Child report	-0.31*	-0.49*	-0.15
Parent report	-0.05	-0.35*	-0.04
Staff impressions	-0.19*	-0.53*	-0.05

NOTE: N = 192

*$p < 0.05$

In addition, problemsolving was found to be negatively related to family coercion, suggesting that parents who practice problemsolving skills tended to exhibit less coercive behavior. Parent and child ratings were specific to the videotaped problemsolving task in which the observation scores were derived.

Several significant correlation coefficients between the two external variables and method factors were also observed. In particular, family coercion was found to be related negatively to two of the three method factors (child report and staff report). Authority conflict was related negatively to parent and staff report. These findings indicated that variance specific to the reporting perspectives of parents and staff were correlated with observed family conflict as well as subsequent discipline contacts with the school and police.

DISCUSSION

The idea that parenting practices contribute to adolescent problem behavior has been around for some time (McCord 1992). The scrutiny of parenting practices within a scientific paradigm has a much shorter history. Which parenting practices are critical to social development and which should be targeted in interventions designed to reduce or prevent adolescent problem behavior? Much of the literature on parenting effects on adolescent delinquency and substance use relies exclusively on child, parent, or staff impressions, as these are the most economical measures. This report is the first example of using a CFA approach to MTMM data on parenting to rigorously evaluate the relative importance of traits versus methods in accounting for covariation. The authors suggest that taking a confirmatory approach to studying an MTMM data set on parenting is informative to development and intervention research that focuses on families.

Results from this study provided support for the construct validity of the parenting constructs. Limit setting did not survive the basic test of convergent validity. This finding is consistent with results reported by Patterson and colleagues (1992), who eventually relied on home observation indicators that included nattering, the parents' abusive behavior toward their son, and staff impressions of even-handed and consistent discipline practices. In this study, the child and parent reports did not correlate highly with these direct observation indicators. Current results revealed that the retest stability (see table 1) of the coder impressions of limit

setting was quite low, indicating problems in reliability. With respect to staff impressions, one problem may have been that the coders could not make good judgments regarding the parents' limit-setting practices by watching them in problemsolving discussions.

The four remaining constructs showed reasonable convergent and discriminant validity within the MTMM framework. The correlations among the four constructs were quite high (M = 0.660, based on M_3), suggesting that parents who score highly on one dimension tended to score highly on all dimensions of the parenting constructs. In fact, the level of correlation suggests a "G-factor" for parenting. If so, the debates in the literature regarding the specific parenting practices and family experiences that give rise to socialization outcomes such as antisocial behavior are not warranted, as one parenting practice appears to be roughly equal to another. There is a limited sense in which this conclusion is valid. Skillful parenting certainly requires attention to relationship issues in daily family life. Although parent training interventions do not often couch the intervention procedures in the language of relationships, if one looks closely at the actual parenting skills, relationship skills are essential to short- and long-term success. For example, when advising parents on limit setting, it is recommended that parents avoid personal criticism, lecturing, or expressions of contempt (Dishion and Patterson, in press; Forgatch and Patterson 1989; Patterson and Forgatch 1990).

When it comes to the field of family intervention, the debate regarding the optimal targeting of parenting practices is more than academic. Recommending that parents express more love to their child as an antidote to problem behavior is quite different than suggesting different behavior management practices. A family management intervention model hypothesizes that the pattern of parent-child interactions need revision vis-a-vis the issue of contingency (Dishion and Kavanagh, in press; Patterson et al. 1992). Based on the pattern of convergent and external validity, the authors speculate that parent monitoring is a construct that has potential as an intervention target. This construct has repeatedly been shown to correlate with adolescent problem behavior and substance use, and these findings have been extended to multiethnic and urban samples (Chilcoate et al. 1995). Inspection of the level of correlation between parent monitoring and relationship quality ($r = 0.63$) reveals that for effective supervision, a positive relationship between parents and their teenager is requisite.

Methodological Implications

There were substantial method effects in the CFA that must be taken into account when modeling these 12 indicators to define parenting practices. In this study, the method effects were conceptualized simply as those accompanying the reporting agent. Thus, each reporting agent brings to the global ratings an internal coherence that is not attributable to the behavior that they are being asked to rate. Combining the method and trait constructs was referred to as the "relativistic theory of measurement." The central idea is that the variation within each indicator is attributable to both the behavioral phenomenon and the measurement tool, in this instance reports of the participating parents and children, and that of the research assistants.

The problem of method effects has been acknowledged and discussed in previous research (Bagozzi and Yi 1990; Bank et al. 1990; Fiske 1986, 1987). From a traditional psychometric perspective, measurement method effects are interpreted in terms of sources of systematic bias (Fiske 1987) or criterion contamination (Brogden and Taylor 1950). Bagozzi and Yi's (1990) definition is typical of this position: "As an artifact of measurement, method variance can bias results when researchers investigate relations among constructs measured with the common method" (p. 547). The same argument was made in Cook and Campbell's (1979) discussion of monomethod bias. Bank and colleagues (1990) extended this discussion to the MTMM data, when one method tends to dominate across constructs, referring to this as the "glop problem" in structural equation modeling.

The findings from the present study raise questions of how to interpret these measurement method effects. One interpretation is that they reflect different overall perspectives on parenting practices. Each agent has expectations based on his or her life experience, unique context, or reporting biases. For example, parents' interpretation of the self-report items may well depend on their own parenting practices or their own response style (e.g., high social desirability). By the same token, staff impression scores may be biased with respect to broadband personality attributions made about the parents, cultural expectations, as well as behavior observed in the assessment setting. In either case, this aspect of method bias can be considered "noise" when studying the relationship between parenting and adolescent problem behavior.

An alternative view of the method effects is that the variance is theoretically meaningful. The fact that the child and parent methods correlated, as did the parent and staff impressions (while child and staff methods did not), suggests that shared perspectives yield similar reporting tendencies. Method effects may not be noise but theoretically meaningful. If, for example, it were found that the child's perceptions of parenting practices had long-term predictive utility over and above the observed parenting practices, this would suggest that a child's positive reporting bias is developmentally significant, perhaps an indicator of the quality of the parent-child relationship.

Future Research Needs

Research scientists in the field clearly state that construct development is an iterative process (Nunnally 1978). Patterson and colleagues (1992) link advances in psychometric studies and model development to intervention trials. The authors suggest that reliance on global reports of parenting practices will lead to highly intercorrelated parenting constructs, with a good percentage of their covariation attributable to method variance. When aggregating method and trait variance, the theoretical meaning of each in subsequent modeling is confused. These analyses suggest that continued study of the interrelation between measurement method and parenting practices is needed.

In general, direct observations are underutilized in developmental and intervention research. One of the critical advantages of observational data in developmental research is the ability to study the microsocial processes underlying socially significant child and adolescent outcomes (Patterson 1982). Laboratory assessments of parent-child interaction may be particularly useful to this end. The advantage of structured assessments is that sequences of interest can be elicited by the design of the task. The parenting constructs studied in this report are better suited for direct assessments rather than by global reports (e.g., limit setting, positive reinforcement, problemsolving, and perhaps monitoring).

The key idea in limit setting is that the parent does not contribute to the coercion process by using aversive tactics to set limits, but consistently follows through with consequences when limits are violated (Patterson 1982).

Positive reinforcement is potent when it contingently matches new behaviors that a child is learning or positive behavior that is replacing

previous bad habits. Problemsolving has been successfully measured in a laboratory setting by Forgatch and Stoolmiller (1994), who report an assessment of problemsolving that has considerable content validity and is based on the participant's ratings of how well the parent and child solved specific problems. Similarly, parent monitoring is a process of establishing procedures and rules regarding norms of behavior along with supervising to ensure that those norms are followed. It may also be that staff impressions of monitoring are useful because of the complex set of skills required to supervise adolescents, which vary from family to family. A single parent may use a different approach to supervising her young adolescent compared with a two-parent family, where one parent is available after school. However, children in both families may be equally monitored. Because of the high level of predictive validity of the monitoring construct and the importance of the parenting practice it measures during adolescence, this construct is critical for developmental and intervention science. In contrast, the relationship quality construct may best be measured by the participants' global impressions. Positive indications of a healthy parent-child relationship are that the child feels the parents are fair, the parents are satisfied with the child's level of cooperation, and the family enjoys recreational time together.

In this sense, all measures are not equal in the assessment of parenting practices. Thus, method and trait variance are conceptually related. The authors concur with the clear and insightful discussion of Fiske (1987), that the construct validation process is crucial and not an inconvenient annoyance to be surmounted in a quick pilot study to evaluate whether a single measure of parenting has internal consistency or predictive validity.

Understanding the full range of validity issues, including criterion and predictive validity, is critical, not only to advances in understanding the influence of families on adolescent problem behavior but also to advances in intervention science. A particularly relevant problem in intervention science is the measurement of change. Measures are needed that accurately reflect the ebb and flow of human behavior in the course of natural development as well as change that occurs in response to interventions. Direct observations are one solution to this problem. In addition, any assessment that includes the temporal dimension to behavior is relevant to the issue of change. Overreliance on the personality assessment strategy has had a deleterious impact on measurement strategies of the sensitivity to change. For example, many

of the measures included in this chapter provided the typical response format "always" through "never." Whether these are measured on a 5- or 10-point scale, this assessment strategy lacks a temporal specificity. It would be difficult for anyone to tell when there had been meaningful change from one assessment probe to another. Based on the analyses in this chapter, as well as the body of research on adolescent problem behavior, the authors suggest that further development is needed of measures of parent monitoring that are sensitive to change.

The solution to these problems, as suggested by Fiske (1987), is to be more specific in the conceptualization and instrumentation of parenting constructs. Given this perspective and the findings from these analyses, the authors hope to be part of a new movement in the behavioral sciences that invests more energy, talent, and resources in the conceptualization and measurement of independent and dependent variables in the study of social development and its manipulation within the context of prevention.

NOTES

1. The initial CFA analyses based on the five dimensions of parenting practices model failed to converge to a solution. Examination of the EQS output showed an improper solution for one parameter estimate; that is, the correlation between the two latent constructs of monitoring and limit setting was found to exceed unity in both the M_1 and M_3 models. This may be due to the similar measures used in operation-alizing the two constructs. On the basis of statistical and substantive grounds, the authors decided to drop the limit-setting construct. All subsequent analyses (i.e., the Campbell-Fiske and CFA approaches) were based on four constructs: monitoring, relationship quality, problemsolving, and positive reinforcement.

2. Two variables in the model tested were controlled for possible confounding effects: gender and family status. Control for gender was achieved by creating a gender factor in the M_3 model, and the factor was allowed to be correlated with each of the four parenting practice (trait) factors. The factor, as a dichotomous variable (1 = male, 2 = female), had its loading fixed to one. Inspection of the correlations between gender and all four trait factors indicated no statistically significant relationships, suggesting no gender differences on any of the four parenting practices constructs. In addition, EQS Lagrange Multiplier Test for the observed indicators of parenting

practices factors on gender factor were all minimal and nonsignificant, suggesting that the items worked similarly for boys and girls. Control for family status (i.e., single parent, bioparent, stepparent) was accomplished by creating two dummy variables and estimated in the M_3 model. The first dummy variable used the single parent as a reference group, and the second dummy variable used the bioparent as a reference group. Creation of these two variables led to the comparison of the reference group with the remaining two groups. Parameter estimates (i.e., the correlations between family status and all four trait factors) showed no statistical significancies except for the relationship quality construct, 0.20, $t = 2.28$, $p < 0.05$, which suggested that the single-parent family tended to exhibit better relationship quality than the biofamily and stepfamily parents.

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ACKNOWLEDGMENTS

This chapter was prepared with support from National Institute on Drug Abuse grant no. DA-07031 and National Institute of Mental Health grant nos. MH- 37940 and MH-46690.

AUTHORS

Thomas J. Dishion, Ph.D.
Principal Investigator
Oregon Social Learning Center
Associate Professor
University of Oregon

Fuzhong Li, Ph.D.
Research Associate

Kathleen Spracklen, B.A.
Research Associate

Gene Brown, B.S.
Data Analyst

Eric Haas, B.A.
Research Associate
Oregon Social Learning Center
207 East 5th Avenue, Suite 202
Eugene, OR 97401

APPENDIX

The authors had complete information on the two external variables from 195 participants and incomplete information from 25 participants for an N of 220. Using the EQS multisample approach to missing data enabled incorporation of all 220 cases in the analysis for the M_4 model. As such, subsample 1 included 195 cases with no missing data, and subsample 2 included 25 cases missing data from the family coercion variable.

The multisample procedures to missing data involve tests of two major hypotheses: missing at random (MAR) and missing completely at random (MCAR) (Little and Rubin 1987). Briefly, data are considered MAR if the pattern of missing data is not dependent on values of X (a single variable). Furthermore, data are said to be observed at random (OAR) if the pattern of missing data is independent of values of other observed variables (e.g., Y, Z). Both MAR and OAR conditions constitute what Rubin (1976) defined as MCAR. A satisfaction of MAR and MCAR is considered to have an ignorable missing-data mechanism. As such, those with missing values on the X variable are assumed to be a random subsample of the original sample.

Following the analytic procedures described by Muthen and colleagues (1987), Allison (1987), and Duncan and Duncan (1995), the hypothesis that data are MCAR was tested. The test specified an unrestricted H_1 model that involves imposing equality constraints on common parameters (i.e., means, intercepts, variances, and covariances of the observed variables) across the subgroups. If these common parameters may be treated as invariant, then the MCAR hypothesis is considered to be supported. If, however, the H_1 model is rejected, indicating that MCAR is not tenable, a less stringent hypothesis, MAR, is then pursued. This is referred to as the "restricted H_0 model," which is itself a model of

substantive interest. Refer to Duncan and Duncan (1995) for details on MCAR and MAR hypothesis testing.

The model fitting for the H_1 model yielded a chi-square value of c^2 90 (N = 220) = 95.68, $p > 0.32$, and fit indices of TLI = 0.99 and CFI = 97. The results indicated that MCAR was tenable, and therefore, the mechanism that is causing the missing data is considered ignorable. Consequently, maximum-likelihood estimation would exhibit no sample bias.

Selecting Parenting Measures for Assessing Family-Based Prevention Interventions

Robert J. McMahon and Carol W. Metzler

INTRODUCTION

The purpose of this chapter is to assist researchers in selecting promising parenting measures for assessing the outcome of family-based prevention interventions.

The metaconstruct of parenting covers a wide variety of more narrowly defined constructs, including parenting practices, parenting style (see Darling and Steinberg 1993), and parental social cognitions. Parenting practices refer to sets of specific parenting behaviors that parents are observed to do, report that they do, or say they would do in interactions with their own children. They vary by specific content (e.g., praising the child, checking the child's homework on a regular basis) and socialization goals (e.g., cooperation with family members, academic achievement). Parenting style refers to the more global context in which parenting practices are implemented, as opposed to actions that are domain specific. Parenting style is thought to moderate the effectiveness of parenting practices. Parental social cognitions refer to parents' attitudes, values, and beliefs concerning parenting. The focus of this chapter is on parenting practices (see Liddle and Rowe, this volume, which focuses on measures of family functioning).

This chapter uses the term "promising" measures rather than "best" measures for several reasons. First, the measures described below are not intended to represent an exclusive list; instead, they represent examples of various types of measures of parenting practices. Second, these measures should not be required or necessarily be expected to be included in funding guidelines issued by granting agencies. Instead, measurement selection should be based on consideration of the issues, presented in the next section of this chapter. Finally, it is felt that the term "promising" captures an essential characteristic of these measures of parenting practices—that they have been, and will continue to be,

evolving. In other words, these measures are not finished products, but rather are currently useful and promising.

Although there are several promising measures of parenting practices, a serious weakness in this area of measurement has been the lack of attention to the cultural sensitivity of these measures. Measures of parenting practices, including the examples described in this chapter, have, for the most part, either been validated with nonminority populations or failed to directly assess the possibility of differential applicability to various minority populations when mixed samples have been included. Rarer still is the situation where a well-validated measure of parenting practices has been developed specifically for a particular cultural group.

In this chapter, the focus is on two tasks: (1) describing a number of issues to be considered in selecting appropriate measures for evaluation of family-based prevention interventions and (2) delineating five types of methods of assessing parenting practices. Within each method, a cluster of measures that meets reasonable psychometric criteria and that has been employed by at least two research groups is presented. Each cluster contains a description of the original measure as well as descriptions of at least one additional adaptation or derivation. The purpose in presenting these clusters is to demonstrate the dynamic and evolutionary nature of the measurement process.

ISSUES IN SELECTION OF MEASURES OF PARENTING PRACTICES

Several issues in the selection of measures of parenting practices are presented:

- Theoretical constructs and objectives of the intervention
- Populations
- Developmental period
- Methods
- Informants
- Psychometric properties
- Longitudinal measurement

Theoretical Constructs and Objectives of the Intervention

The measurement selection process must first and foremost be guided by a theory or model that specifies key constructs and construct indicators, the interrelationships among intervention variables (e.g., presence or absence of the intervention, intervention dosage, intervention integrity), and intervention outcomes (Collins and Shanahan, this volume). Most of the theories and models relevant to family-based intervention hypothesize that specific parenting practices mediate intervention effects on targeted child outcomes (e.g., diminution of conduct problems, delayed onset of substance use, decreased school dropout). Some of these models delineate sequences of various types of parenting practices and child behavioral outcomes (e.g., Spoth, this volume), specifying hypothesized chains of proximal and distal effects.

Examples of parenting constructs that have been identified in the literature as being important in predicting child outcomes include discipline, monitoring, problemsolving, and positive involvement; there are numerous others. Researchers must identify the particular parenting constructs of interest before they will be able to identify the most appropriate measures of those constructs.

Researchers must carefully consider the goals of their interventions in order to ensure that the particular parenting constructs and measures of parenting practices that are chosen will capture the changes expected to occur as a function of the intervention.

Populations

The nature of the population of interest in a particular study should also guide the selection of measures of parenting practices. Important characteristics to consider include (1) the risk status of the children or families (i.e., whether they are high-risk or general populations); (2) the culture and language of the population; (3) social class; (4) family structure; and (5) other special characteristics such as literacy rates, rural versus urban status, and whether the population is characterized by significant recent disruption, unemployment, or immigration. Each of these population characteristics will have different implications for measurement selection. For example, the culture and language of the population will dictate the need for measures that are (at the very least) in the appropriate language and that use concepts understandable to that particular cultural group; different social classes and literacy levels will

have implications for the reading level of a self-report instrument. Characteristics such as typical family structure or risk status of the population will have implications for the ways in which questions or tasks are framed and the expected range of responses—an instrument intended for use with an at-risk population may not be sufficiently sensitive to the range of responses of a general population and vice versa. Recent immigration, widespread unemployment, and urban versus rural status all require attention to issues of ease of administration, cost to participants, and sensitivity to families' particular circumstances. The developmental status of the focal children is a population characteristic of primary importance in the selection of measures and is discussed below.

Developmental Period

One of the most practical decisions facing researchers is the choice of measures of parenting practices that are appropriate to the developmental period of the children of focus. This will have important implications for the particular methods, informants, timeframes, and parenting constructs of interest, as well as the individual measures themselves. For example, although parental report of parenting practices appears useful at all developmental periods, the particular items used as indicators of parenting practices will differ as a function of the child's age. Assessment of parental monitoring (see Dishion and McMahon, this volume) in a family with a toddler will likely focus on the extent to which the parent tracks the child's ongoing activities in the home. On the other hand, assessment of parental monitoring of an adolescent will be more concerned with the extent to which the parent is aware of the teen's whereabouts, activities, and companions when away from home. Using children as informants about parenting practices can be quite useful during adolescence and perhaps middle childhood, but preschool or children in early grades are less likely to be considered appropriate informants. With regard to methods, observational procedures to assess parenting practices are highly useful throughout the developmental period, but the nature and structure of the observational tasks often vary with the age of the child (e.g., observation of play versus family problemsolving discussions). The timeframes for responding on individual items of a measure may also need to vary as a function of the child's age, with shorter intervals perhaps being more applicable for measures pertaining to younger children.

Methods

The methods that are most applicable to the measurement of parenting practices include observation; interviews (in person or on the telephone); questionnaires; analog vignettes or simulated tasks using written, audiotaped, or videotaped vignettes as stimuli; and archival records (e.g., documentation of physically abusive parenting through examination of child protective services records). It is recommended that, to the extent possible, researchers use multiple methods of measuring parenting practices gathered from multiple informants, rather than relying on a sole method and sole informant. Much previous research has illuminated the problem of monomethod bias, a source of systematic bias that inflates relations among constructs measured with the same method and informant. Multimethod, multi-informant research methods can reduce the fallibility of reliance on a single assessment strategy (Dishion, Li, Spracklen, Brown, and Haas, this volume; Fiske 1987).

The setting in which each of these methods are employed is also relevant. For example, observations can occur in the home, research laboratory or clinic office, or community (e.g., the grocery store). More "naturalistic" unstructured observations generally occur in the home or community, whereas structured observation tasks generally are conducted in the laboratory or in a clinic office. The level of focus of these observational procedures also varies as a function of the type of coding system that is employed (e.g., microanalytic versus global) and whether the observers also record more general impressions following the observation.

The effects of various procedures for administration of measures, in terms of both single measures as well as assessment batteries, have been largely unexamined, but are important considerations. Issues include the length of individual measures and of the total assessment battery, the particular sequencing of measures, the frequency of administration, the balance between (and within) measures that focus on parenting competencies versus deficits, the veracity of measures (i.e., optimizing conditions for truthful responses), and the overall burden on research participants. Flexibility in timing and location (e.g., research center versus the home) of the assessment has also been noted as an important process issue (Capaldi et al., in press).

Informants

The most frequently used informants concerning parenting practices are the parents themselves, independent observers, and the children. However, other potential sources of information about particular aspects of parenting include teachers (e.g., parental involvement in the child's schooling), family service workers, and other family members (e.g., a spouse, the child's siblings). An especially vexing issue is the extent to which other individuals in addition to the primary caregiver (usually the mother) should be included in the data collection process. Should the father's data always be included in two-parent families? Should other caregivers who spend significant amounts of time with the child (e.g., babysitters, a noncustodial parent, grandparents, aunts, older siblings) also be assessed with respect to their "parenting" practices? To do so is likely to provide a more complete and accurate picture, not only of the types of parenting that the child receives but also the extent to which such parenting is consistent across providers. However, it presents major measurement, design, and data-analytic challenges (see Collins and Shanahan, this volume, for an extended discussion of these issues.)

As described earlier, the decision regarding multiple informants is a critical one. Reliance on a sole informant on parenting practices is likely to yield biased reports and substantial method variance. Thus, researchers are encouraged to use multiple informants to the extent that it is practical. When parents and children are asked the same questions about parents' behavior, their answers frequently fail to agree; similarly, parent reports will often fail to converge with observer reports. Although this lack of convergence among informants will create substantial data-analytic challenges (Bank et al. 1990), each informant provides a unique perspective that yields valuable information for understanding the effects of parenting practices on child behavior.

Psychometric Properties

Three aspects of the psychometric properties of measures of parenting practices are of particular relevance in selecting measures. The importance of the first two, reliability and validity, is self-evident, and will not be discussed further in this chapter (see Kamphaus and Frick 1996 for an excellent discussion of reliability and validity with respect to measures of child and familial functioning). It should be noted that the use of multiple methods and multiple informants poses special challenges regarding reliability and validity in the context of structural

equation modeling (see Bank et al. 1990; Dishion, Li, Spracklen, Brown, and Haas, this volume).

The third aspect, which is referred to as "sensitivity to change," requires more elaboration. At the broadest level, it refers to whether the measure demonstrates an intervention effect when such an effect truly occurs. Failure to do so may be a function of problems with the specificity of the measure, the population for whom it is intended, a mismatch between parenting behaviors targeted by the assessment and behaviors targeted by the intervention, or assessment-by-intervention interactions. First, the way the questions are framed will likely affect sensitivity to change. For example, the response scale on a parent report questionnaire may be too general to capture subtle distinctions (e.g., "never" versus "sometimes" versus "always"). In addition, the temporal specificity of parent and child report items has an important effect on their sensitivity to change. The time interval for reporting the frequency of any given behavior should be long enough for the behavior of interest to have occurred, yet short enough for the respondent to remember and report the frequency of the behavior accurately, and to have no overlap between assessment periods. Global reports without sufficient temporal specificity may well be unable to capture subtle changes; in contrast, specific frequencies of well-defined behaviors within a clear timeframe are likely to have the best potential to capture change.

Second, population characteristics need to be considered when assessing sensitivity to change. For example, a measure that has been shown to be sensitive to changes in parenting practices in a high-risk population may not be sensitive to more subtle changes that occur in a general population. In other words, the magnitude of the expected effect size of the intervention for the particular population of interest must be taken into account when selecting measures for prevention interventions.

Third, the degree to which the parenting behaviors measured in assessment match the parenting behaviors targeted in intervention will greatly affect sensitivity to change. If major parenting constructs addressed by an intervention (e.g., limit setting, positive reinforcement, monitoring) are measured weakly or not at all in the assessment, then changes in these constructs as a function of intervention are not likely to be captured. Researchers are encouraged to align intervention and assessment targets as much as possible.

Finally, assessment-by-intervention interactions may occur. These can affect parental reports of parenting practices and of child behavior. For example, prior to intervention, parents may perceive themselves to be competent monitors of their children and would rate themselves accordingly. However, as a function of intervention, parents may learn that their previous monitoring was not as appropriate as they thought; furthermore, parents learn the skills necessary to become more effective monitors. Pretest and posttest comparisons may indicate little change in parental ratings of their monitoring, even though there has been significant improvement. Similarly, an intervention that improves parental monitoring may make parents more aware of their children's inappropriate behaviors. Comparison of parental reports of child behavior prior to and after the intervention may actually suggest that parents perceive deterioration in their children's behavior, when in reality the parents have simply become better monitors of their children's behavior (Dishion and McMahon, this volume). Thus, in this situation, the researcher may wish to consider other informants, such as the child or independent observers, who may be less susceptible to this phenomenon. Alternatively, if parent report is used, then greater reliance may be placed on recording the frequency of occurrence of specific monitoring behaviors, as opposed to more subjective ratings.

Longitudinal Measurement

The issues raised up to this point apply to both cross-sectional and longitudinal measurements of parenting practices. When dealing with longitudinal measurement, however, the complexity of the measurement issues is magnified dramatically. In measuring parenting practices over time, the researcher is faced with discontinuities in both the measurement of parenting practices and in the parenting practices themselves (see Collins and Shanahan, this volume). As noted earlier, currently available measures of parenting practices are applicable to particular developmental periods (e.g., preschool, middle childhood). The authors are not aware of any measures of parenting practices that have been validated for use across several developmental periods. The implication for researchers whose investigations span multiple developmental periods is that they will be forced to switch measures of parenting practices as the children in their sample get older. This presents major difficulties for the statistical analyses of longitudinal data, which require that the same measure be administered at each time point (see Collins and Shanahan, this volume).

Parenting practices typically change over time (or at least they should) as the child enters new developmental periods. Thus, there is also discontinuity in both the children's behavior and the parenting practices that are most appropriate for dealing with those changing child behaviors. Family contexts also change over time, with the departure of a parental figure due to separation or death and the arrival of new family members such as siblings or stepparents. Thus, the family context in which parenting practices occur also changes over time in ways that are much less predictable and more individualized than changes in parent and child behaviors associated with the child's movement through different developmental periods (Collins and Shanahan, this volume).

Finally, retention of the sample in longitudinal investigations is a critical issue. With each passing year of involvement, the families' continued participation becomes increasingly important. Researchers must be actively involved in developing methods to increase the likelihood of continued familial involvement in long-term prevention intervention studies (see Capaldi et al., in press, for a discussion of such strategies). As noted earlier, this might include sensitivity to the length of the assessment battery as well as the relative proportion of measures (and items within measures) that tap negative, as opposed to positive, behaviors or practices.

SELECTED MEASURES OF PARENTING PRACTICES

The following section presents descriptions of several sets of promising measures of parenting practices that are illustrative of different types of assessment methods. Within each set of measures, at least one adaptation of the measure is also described to provide the reader with a better sense of the evolving nature of the measurement process.

Selection Criteria

Three criteria were employed to select the clusters of promising measures: (1) the measure has adequate psychometric properties (i.e., reliability, validity, and sensitivity to change); (2) the measure has been employed by more than one research group; and (3) the measure has been included in at least two published studies. The relevance of the first criterion is self-evident. Use of the measure by more than one research group was considered to provide some support for the generalizability of the measure. Inclusion of the measure in at least two

published research studies suggests that the measure has undergone at least some form of peer review.

Five clusters of measures are presented in table 1[1]. They include the following methods and informants: (1) observations by independent observers, (2) observer ratings and impressions, (3) telephone interviews with parents and children, (4) face-to-face parent interviews, and (5) parent questionnaires.

Observations by Independent Observers

Two observation measures that have evolved from a common background and that have been widely employed to assess the outcome of social learning-based family interventions with young children (ages 3 to 8 years) are the Dyadic Parent-Child Interaction Coding System (DPICS) (Eyberg and Robinson 1983; Eyberg et al. 1994) and the Behavioral Coding System (BCS) (see Forehand and McMahon 1981). The DPICS II (Eyberg et al. 1994) is a revised version of the DPICS (Eyberg and Robinson 1983), which, while similar in purpose and structure, has undergone substantial expansion from the original version. Both the DPICS and the BCS are modifications of the assessment procedure developed by Hanf (1970) for observing parent-child interactions in clinic or laboratory playrooms; however, both systems have also been employed and validated in home observations.

Administration. In the clinical or laboratory setting, a parent-child pair is observed in a playroom equipped with various age-appropriate toys. An observer codes the parent-child interaction from an adjoining observation room. Prior to the observation, each parent is instructed to interact with his or her child in several different contexts. These include free play (referred to as "Child-Directed Interaction" in the DPICS and "Child's Game" in the BCS) and parental control (referred to as "Parent-Directed Interaction" in the DPICS and "Parent's Game" in the BCS) tasks. The DPICS also includes a third structured task: Clean Up. Each of these tasks lasts 5 to 10 minutes. Because the time spent in assessing parent-child interactions is relatively short, this playroom observation procedure can be repeated frequently, thus providing an ongoing assessment of intervention effects.

The DPICS II offers flexibility in the methods for recording data. Coding can be conducted using paper-and-pencil systems that yield frequency counts or in which behaviors are recorded sequentially in

TABLE 1. *Examples of promising measures.*

Method/Name of Instrument	Authors	Parenting Variables Assessed
Observation by Independent Observers		
Dyadic Parent-Child Interaction Coding System (DPICS)	Eyberg and Robinson (1983)	Commands, descriptive and reflective statements, questions, acknowledgments, irrelevant verbalizations, praise, physical, critical statements
Behavioral Coding System	Forehand and McMahon (1981)	Rewards, attends, questions, commands, warnings, timeout
DPICS II	Eyberg et al. (1994)	Verbalizations, vocalizations, physical behaviors, responses following commands, responses following questions
DPICS-R	Webster-Stratton (1994)	DPICS variables plus positive and negative affect, problemsolving, parenting disagreement, specific parenting strategies
Fast Track Adaptation of Behavioral Coding System	McMahon and Estes (1993)	Commands, positive attention, negative attention
Observer Ratings/Impressions		
Oregon Social Learning Center Observer Impressions Inventory	Weinrott et al. (1981)	Hostility, disorganization[a]
Fast Track Coder Impressions Inventory	McMahon and Lengua (1996)	Appropriate discipline, harsh discipline, warmth
Webster-Stratton Adaptation	Webster-Stratton (1996*b*)	Nurturing/supportive, harsh/critical, discipline competence

TABLE 1. *Examples of promising measures (continued).*

Method/Name of Instrument	Authors	Parenting Variables Assessed
Telephone Interviews with Parents and Children		
Parent/Child Daily Report	Dishion et al. (1984*a*, *b*)	Monitoring, positive reinforcement, discipline
Daily Telephone Discipline Interview	Webster-Stratton and Spitzer (1991)	Physical force, critical verbal force, limit setting, teaching, empathy, guilt induction
Parent Interviews		
Oregon Social Learning Center Parent Interview	Capaldi and Patterson (1989); Oregon Social Learning Center (1991)	Monitoring, positive reinforcement, discipline[a]
Webster-Stratton Adaptation	Webster-Stratton (1996*b*)	Harsh, consistent, and positive discipline; physical force; critical verbal force; limit setting; teaching empathy; guilt induction
Parent Questionnaires		
Iowa Youth and Families Project Child Management Scale	Conger (1989)	Monitoring, inconsistent discipline, harsh discipline, communication
Spoth Adaptation	Spoth et al. (1995, in press)	Monitoring, effective discipline, positive reinforcement

[a]Depending on the version, other parenting behaviors or constructs may be measured as well.

10-second intervals or a computer software program to record data in real time (Celebi and Eyberg 1994).

Variables Assessed. The DPICS included 12 parent behaviors and 7 child behaviors. The parent behaviors were (1) direct commands, (2) indirect commands, (3) descriptive statements, (4) reflective statements, (5) descriptive/reflective questions, (6) acknowledgments, (7) irrelevant verbalizations, (8) unlabeled praise, (9) labeled praise, (10) physical positive, (11) physical negative, and (12) critical statements. The DPICS II includes 26 behavioral categories, which can be coded for both parents and children. There are five categories of behavior: verbalizations (e.g., labeled praise, direct command, criticism), vocalizations (e.g., laugh, whine), physical behaviors (e.g., physical positive, destructive), responses following commands (e.g., compliance, noncompliance), and responses following information questions (e.g., answer, no answer). Coding categories may be reported as individual frequencies or combined into summary variables such as total praise, command ratio, or inappropriate behavior.

The BCS (Forehand and McMahon 1981) consists of six parent behaviors and three child behaviors. Parent behaviors include rewards (praise or positive physical attention); attends (description of the child's behavior, activity, or appearance); questions; commands (alpha commands are directives to which a motoric response is appropriate and feasible, beta commands are commands to which the child has no opportunity to demonstrate compliance); warnings; and time out. The child behaviors are compliance, noncompliance, and inappropriate behavior (whine-cry-yell-tantrum, aggression, deviant talk).

Psychometric Properties. The DPICS standardization study (Robinson and Eyberg 1981) reported adequate interobserver reliability; the means for parent and child categories were 0.91 and 0.92, respectively. A shorter version of the DPICS II intended for clinical use has been shown to have acceptable reliability estimates for nearly all parent and child categories (Bessmer 1993, cited in Eyberg et al. 1994).

The DPICS was successful in describing the parent-child interactions of children with conduct problems (Wruble et al. 1991) and was a sensitive measure of treatment outcome for these children in both the clinic (Eisenstadt et al. 1993) and the home (Webster-Stratton 1984). It has been used in conjunction with attachment variables to discriminate clinic-referred boys with conduct problems and control boys (Speltz et

al. 1995). Recent investigations using the DPICS II indicate that differences between referred and nonreferred children with conduct problems are detectable (Bessmer 1993) and that this measure is sensitive to treatment outcome in the clinic setting (Eyberg et al. 1995).

Using the BCS, Forehand and Peed (1979) reported an average interobserver agreement of 75 percent. The BCS possesses adequate test-retest reliability as well. Data from repeated observations of nonintervention parent-child interactions are stable and consistent with this coding system (Peed et al. 1977). With respect to validity, the BCS has been shown to discriminate between clinic-referred and nonreferred children in both the clinic (Forehand et al. 1975) and in the home (Griest et al. 1980). In other studies, parent-child interactions in the clinic have been shown to be similar to those observed in the home (Peed et al. 1977) and to predict child behavior in the home (Forehand et al. 1978). The observation procedure is also sensitive enough to measure significant treatment effects in the clinic and home (see McMahon and Forehand 1984 for a review).

Adaptations. Both the DPICS and the BCS have also been employed in the home in less structured contexts than the tasks employed in the clinic or lab. However, such home observation sessions are not completely unstructured, with limitations on certain activities (e.g., no telephone or television use) and who should be present (e.g., all family members, no guests).

When the DPICS has been employed in home observations, multiple sessions are conducted. For example, Webster-Stratton (1984) observed each child interacting with the mother and the father for 30 minutes each on two separate days during each assessment period. Observations were conducted between 4:30 p.m. and 7:30 p.m. When employed in the home setting, the BCS (Forehand and McMahon 1981) is used to collect data in blocks of four 40-minute observations, conducted on different days. The BCS permits the behavior of only a single adult and a single child to be recorded at a given time. If more than one parent is being observed, then separate observation sessions may occur with each parent and child, or the observer can code the behavior of each parent with the child in alternating 5-minute periods (Forehand and McMahon 1981).

Webster-Stratton (1994) has developed a modification to the original DPICS that she refers to as the DPICS-R (for "Revised"). Primary revisions include the addition of microanalytic codes for positive and

negative affective behaviors (e.g., smiles, tone of voice) and problemsolving and five-point observer ratings of parental nonverbal affect (ranging from exuberant affect to unrestrained negative affect) during parent-child interactions observed in the home. She has also added codes that include sibling deviance, parenting disagreement and criticisms, and other specific parenting strategies such as time out, loss of privileges, warnings, and "Grandma's Rule." This version of the DPICS has been demonstrated to be sensitive to intervention effects in the home with both clinic-referred (e.g., Webster-Stratton 1994, 1996*a*) and high-risk samples (Webster-Stratton 1996*b*), both at posttreatment and at subsequent followups.

McMahon and Estes (1993) developed a simplified version of the BCS that has been employed in structured observations in the home on the Fast Track project with families with children ages 6 to 8 years (Conduct Problems Prevention Research Group 1992). It has fewer codes to maximize reliability and reduce training time while retaining important treatment outcome information regarding parent-child interactions. The structure of the session includes Child's Game (5 minutes), Parent's Game (5 minutes), a Lego Task (in which the child is told to construct a developmentally challenging Lego figure and the parent is instructed to give only verbal aid) (5 minutes), and Clean Up (3 minutes). Three parent behaviors (commands, positive attention, negative attention) and three child behaviors (compliance, noncompliance, and disruptive behavior) are recorded. A composite measure of parental warmth/involvement that includes the positive attention score has been shown to be sensitive to intervention control differences in the Fast Track intervention (Conduct Problems Prevention Research Group 1996).

Observer Ratings and Impressions

The Oregon Social Learning Center (OSLC) has pioneered the use of global ratings completed by observers following the completion of observations coded by microanalytic coding systems such as those described earlier. The original version of the Observer Impressions Inventory (OII) (Weinrott et al. 1981) consisted of 25 items, most of which were rated on Likert-type scales.

Administration. Items are completed by the observer immediately following an observation.

Variables Assessed. A cluster analysis of the items in the original OII (Weinrott et al. 1981) indicated that there were four dimensions: hostility, disorganization, child aggression, and parental reactivity to being observed.

Psychometric Properties. The OII showed adequate internal consistency (alpha = 0.73 to 0.88) and discriminated between families with and without children with conduct problems. Two of the four dimensions (disorganization, child aggression) were significantly correlated with pretreatment child aversive behavior scores from a microanalytic coding system and predicted posttreatment child aversive behavior scores as well. Combining the OII data with the pretreatment child aversive behavior scores resulted in the strongest predictor of deviant behavior at posttreatment (Weinrott et al. 1981).

Adaptations. OSLC has developed several versions of the OII to supplement a variety of microanalytic coding systems and observational paradigms. For example, one revision of the OII consisting of 46 items has been shown to contribute significantly to the parental inept discipline construct described by Patterson and Bank (1986). Dishion, Li, Spracklen, Brown, and Haas (this volume) employed a 27-item version that was completed by observers following a family problemsolving discussion task (Forgatch et al. 1985). Items from the inventory contributed to constructs such as monitoring, relationship quality, problemsolving, and positive reinforcement.

Other investigators have also adapted the OSLC observer impressions inventories for use in their own research. The Coder Impressions Inventory (CII) (McMahon and Lengua 1996) is an adaptation of several observer impressions inventories from OSLC that is being employed in the Fast Track project (Conduct Problems Prevention Research Group 1992). It is completed by observers at the end of the structured home observations described earlier and is based on the observer's overall impressions of the parent, the child, and their interactions. The following rationally derived subscales pertaining to parenting practices were supported by confirmatory factor analyses: appropriate discipline, harsh discipline, and warmth. Both appropriate discipline and a composite measure of warmth/involvement, which includes the warmth scale from the CII, demonstrated significant intervention-control group differences at the end of the first year of the Fast Track intervention (Conduct Problems Prevention Research Group 1996).

Webster-Stratton (1996*b*) has employed an expanded version of the Fast Track CII in her own work with younger preschool-age children and their families. She reports three scales related to parenting: (1) nurturing/supportive, which refers to parenting interactions that are characterized by an atmosphere of acceptance, appreciation and respect for the child, positive encouragement, patience, and verbal and physical affection; (2) harsh/critical, which denotes a lack of acceptance, condemnation and disregard for the child, and criticism, sarcasm, neglect, and lack of acknowledgment of the child's abilities; and (3) discipline competence, which refers to the parent's ability to gain compliance utilizing a variety of discipline techniques, clear limit setting, realistic expectations, consistent follow-through, and general confidence. Cronbach's alphas range from 0.84 to 0.91, and interobserver reliabilities ranged from 0.75 to 0.96. In a prevention trial with Head Start families, Webster-Stratton (1996*b*) demonstrated significant differential improvement in parenting practices on each of the three scales of her version of the CII for mothers in the intervention compared with mothers in a control condition.

Telephone Interviews With Parents and Children

An alternative to observations by independent observers in the natural setting is to train parents and children to observe and record certain types of parent and child behavior on a regular basis (e.g., daily). OSLC has developed telephone interviews with parents and children to obtain reports of the occurrence of particular child and parent behaviors during a restricted time period (e.g., over the past 24 hours). The Parent Daily Report (PDR) (Chamberlain and Reid 1987; Dishion et al. 1984*a*) has been widely employed as a measure of parental report of the occurrence of a variety of child behaviors (see McMahon and Estes 1997, for a review of this version of the PDR). Originally developed in 1969, the PDR exists in multiple forms. Current versions consist of various combinations of negative (and in some cases, positive) child behaviors (e.g., Chamberlain and Reid 1987; Patterson and Bank 1986; Webster-Stratton and Spitzer 1991); the PDR has also been modified to have parents report on the occurrence of parent behaviors (e.g., Dishion et al. 1984*a*). In addition, child report versions of these telephone interviews have been developed (e.g., Dishion et al. 1984*b*). This chapter focuses on those versions that collect data on parent practices rather than on child behavior.

Administration. The PDR is typically administered during a series of brief (5- to 10-minute) telephone interviews over the course of 1 to 2 weeks. Respondents are asked whether any of a variety of parenting practices have occurred in the past 24 hours.

Variables Assessed. Parent behaviors, ranging from a single item referring to whether the parent has spanked the child in the past 24 hours to multiple items assessing constructs such as parental monitoring, positive reinforcement, and parental discipline, are included in many versions of the PDR (Chamberlain and Reid 1987; Dishion et al. 1984*a*; Patterson and Bank 1986). Some versions also record the setting in which the problem behavior is occurring (e.g., home, school, community, other).

There is also a parallel form of the PDR for children ages 11 to 14 variously referred to as the Child Daily Report (CDR), the Youth Daily Report, or the Child Telephone Interview. In one version (Dishion et al. 1984*b*; Patterson et al. 1992), the child is asked whether he or she has engaged in any of various conduct problem behaviors or has experienced peer relationship problems, whether peers have engaged in conduct problem behaviors, and whether the parents have engaged in any of several behaviors related to monitoring, discipline, and positive parenting.

The parent practices versions of the PDR and CDR can be employed on a preintervention basis to assess the frequency of various parenting practices and as a check on information presented by the parents in the initial interview. They can also be used during intervention to monitor the progress of the family. Although the child behavior version of the PDR has been employed extensively as a measure of intervention outcome on child behavior (Chamberlain and Reid 1994; Patterson 1982; Sheeber and Johnson 1994), uses of the parent practices versions of the PDR and CDR as measures of intervention outcome on parenting practices do not appear to have been published.

Psychometric Properties. Items from the parent practices versions of the PDR and CDR have loaded significantly, along with items from other methods/informants, on constructs such as monitoring, positive involvement, and positive reinforcement (Capaldi and Patterson 1989; Dishion et al., this volume; Patterson et al. 1992). Dishion and colleagues reported

3-month stabilities of the PDR and CDR for monitoring (0.42 to 0.48), relationship quality (0.60 to 0.67), and positive reinforcement (0.40 to 0.42).

Adaptations. The Daily Telephone Discipline Interview (DDI) was developed by Webster-Stratton (Webster-Stratton and Spitzer 1991) as an addendum to the child behavior version of the PDR to provide more detailed information about parental responses following child misbehavior reported on the PDR. The DDI has been employed with parents of young children (3 to 7 years old) referred for the treatment of conduct problems. Parents are called twice a week for 2 weeks and asked whether each targeted child behavior on the PDR occurred during the past 24 hours. For each behavior endorsed by the parent, the interviewer asks "How did you handle this problem?" Responses are later coded for 43 behaviors that are included in one of six categories: physical force (e.g., spank, restrain), critical verbal force (yell, argue), limit setting (time out, logical consequences), teaching (reasoning, rewards), empathy (identifying warmly with child's feelings), and guilt induction (humiliation, reminding child of mistake). Flexibility and inappropriateness of disciplinary strategy can also be scored.

The DDI possesses adequate psychometric properties. Overall interrater agreement was 80 percent and ranged from 60 to 88 percent for individual categories. Internal consistency was moderate, with alphas ranging from 0.59 to 0.86. Test-retest reliability (1 week) ranged from 0.45 to 0.75. DDI variables were significantly related to parent reports of child behavior problems, observed parent and child behavior, and parental self-reports of personal and marital adjustment and family violence (Webster-Stratton and Spitzer 1991). The DDI has also shown sensitivity to change: The inappropriateness of discipline strategy score predicted long-term parent training outcome at 1 to 2 years posttreatment for girls' (but not boys') teacher-rated conduct problems (Webster-Stratton 1996*a*).

Face-to-Face Parent Interviews

Structured in-person interviews with parents have also proven to be a valuable tool for assessing parenting practices. The example of a structured parent interview presented here was also developed at OSLC (Oregon Social Learning Center 1991). This Parent Interview was originally developed to assess an at-risk population in the Oregon Youth Study (Capaldi and Patterson 1989).[2] Although it has now been adapted

in a variety of ways in more recent studies at OSLC, some recent adaptations have been used with general populations. The interview was originally developed for children in middle childhood, but the questions have now been adapted for a wide age range. To date, the Parent Interview has been used at OSLC with children from preschool age through late adolescence. (If the child is old enough, he or she may also be interviewed about the parents' parenting behaviors, although the description here focuses only on the parent interview.)

Administration. The parent interview lasts approximately 45 minutes. Parents are asked about the frequency with which they engage in various parenting behaviors, such as monitoring, positive reinforcement, and consistent discipline, and how they would handle a variety of discipline situations. Response options for frequency items are typically five-point Likert-type scales from "always" to "never."

Variables Assessed. The Parent Interview is frequently used at OSLC as part of a multi-informant and multimethod assessment battery that includes this interview, telephone interviews, direct observations and/or videotaped interactions, and observer/interviewer impressions. The parenting behavior constructs assessed by the Parent Interview include monitoring, positive reinforcement, and discipline (Capaldi and Patterson 1989).

Psychometric Properties. The Parent Interview has continued to be one of the key forms of assessment in OSLC studies over many years, although the specific content of the interview has varied from study to study, depending on the target population and age of child studied. In general, research at OSLC has shown the Parent Interview to be a valuable source of information about parenting behaviors within the context of multimethod, multi-informant assessment (Dishion, Li, Spracklen, Brown, and Haas, this volume). The Parent Interview is rarely, if ever, used in isolation at OSLC.

Parent Interview items have loaded significantly with items from other methods/informants (e.g., observer impressions, child interview, parent and child telephone interviews) on constructs measuring monitoring, positive reinforcement, and discipline. Reliability and validity scores for these constructs vary from study to study, but monitoring and positive reinforcement constructs generally show good reliability and predictive validity (Capaldi and Patterson 1989; Dishion, Li, Spracklen, Brown, and Haas, this volume; Patterson et al. 1992). Parental reports of

discipline have fared less well, however, because they have not been significantly associated with direct observation measures of parental nattering, abusive behavior, and use of appropriate and consistent discipline or with observer impressions (Dishion, Li, Spracklen, Brown, and Haas, this volume).

Some items from the OSLC Parent Interview have shown sensitivity to change in the context of OSLC's multitrait-multimethod assessments (J. Reid, personal communication, December 1996), although in general, direct observational measures have been more sensitive to change than more global parent reports in the interview in OSLC investigations (Dishion, Li, Spracklen, Brown, and Haas, this volume).

Adaptations. Webster-Stratton (1996*b*) has adapted the OSLC Parent Interview for use with high-risk mothers of preschool-age children (i.e., participants in Head Start). Her version consists of two sections that relate to parents' current parenting practices. One section consists of three summary scores related to the extent to which the parent's discipline is harsh, consistent, and positive. The other section asks the parent to respond to several examples of child misbehavior. Responses are then coded on the DDI (Webster-Stratton and Spitzer 1991). Internal consistency coefficients range from 0.60 to 0.71. Intervention families have shown significant differential improvement on both sections of this measure compared with nonintervention families at both posttreatment and 1-year followup (Webster-Stratton 1996*b*).

Parent Questionnaires

A number of questionnaires specifically designed to assess parenting practices have been developed. Although most often completed by parents, in some cases older children and adolescents serve as informants. As noted by McMahon and Estes (1997), these questionnaires may be especially appropriate as adjuncts to behavioral observations of parenting practices, as methods to assess low base-rate behaviors or behaviors that are otherwise difficult to observe, as screening instruments in multiple-gating procedures to determine when more costly observational procedures are indicated, and as ways to assess intervention effects. Following is a description of a parent questionnaire currently in use by various investigators in Iowa—the Iowa Youth and Families Project Child Management Scale (ICMS).

Conger (1989) derived the ICMS from a set of items originally constructed by Thornberry and colleagues for a study of the causes and correlates of delinquency. Conger and colleagues have applied the ICMS in a longitudinal study of rural seventh graders and their families. This study, the Iowa Youth and Families Project (Conger and Elder 1994), examined an etiological model of economic stressors on family functioning and adolescent adjustment. In applications of the ICMS by Conger and colleagues, it has been used only in combination with the Iowa Family Interaction Rating Scales (Melby et al. 1991), a global observational coding system designed to measure the quality of behavioral exchanges between family members.

Administration. The ICMS is one of several instruments included in a questionnaire booklet administered to families as part of an in-home interview during which family interactions are videotaped. Parents are typically requested to complete the questionnaire booklet during the first segment of the interview, prior to videotaping.

In addition to parental self-report, the young adolescents in the Iowa Youth and Families Project reported separately on fathers' and mothers' child-rearing practices at each wave of data collection, using questionnaire items worded similarly to those responded to by their parents.

Variables Assessed. The Conger version of the ICMS is divided into several subscales: monitoring (6 items), inconsistent discipline (7 items), harsh discipline (4 items), and communication (10 items). Parents respond to each item on five-point Likert-type frequency scales, with the scales anchored by "always" and "never." Subsets of items from the communication subscale have been used to measure communications specific to standard setting, focusing on the use of inductive reasoning (four items) and on verbally rewarding positive child behaviors (two items).

Psychometric Properties. Subscale alpha reliabilities were assessed for both mothers and fathers, across multiple waves of data. The alpha reliabilities for the monitoring subscale ranged from 0.52 to 0.74 for mothers and from 0.63 to 0.77 for fathers. The alpha reliabilities for inconsistent discipline ranged from 0.51 to 0.72 and from 0.53 to 0.62; for harsh discipline from 0.44 to 0.60 and from 0.39 to 0.55; and for communication from 0.80 to 0.84 and from 0.80 to 0.83 for mothers and fathers, respectively. The alpha reliabilities for the parallel youth reports were similar to those for their parents. Parent-reported subscale

measures have been shown to be fairly stable over a 1-year period (Magruder et al. 1992). Preliminary analyses of the correspondence between a subset of observer ratings on the Iowa Family Interaction Rating Scales and parent report of the specific parenting practices on the ICMS indicate correlations between 0.20 and 0.26 across all subscales for both mothers and fathers, with the exception of child monitoring (0.03 for mothers and 0.18 for fathers).

Adaptations. Spoth and colleagues have adapted ICMS subscales for two family-focused prevention intervention outcome studies (Spoth et al. 1995, in press). Spoth and colleagues (1995) used both the ICMS and the Iowa Family Interaction Rating Scales (Melby et al. 1991) to measure a global parenting construct of "general child management." Eight subscale items from the ICMS, representing three types of parenting practices (monitoring; effective discipline, including setting standards and consistent discipline; and rewarding positive child behavior), were combined with seven observer ratings from the Iowa Family Interaction Rating Scales. At pretest, the alpha reliabilities for the composite measure were 0.76 for mothers and 0.74 for fathers. At posttest, reliabilities for the mother and father measures were 0.72 and 0.70, respectively.

An intervention outcome model specified the expected relationship between "intervention-targeted parenting behaviors" (a measure designed to be sensitive to the specific behaviors directly targeted by the intervention, such as parental explanation of rules regarding substance abuse) and the more global general child management construct. The latter construct was expected to be indirectly influenced, rather than proximally influenced, by the intervention and therefore moderately sensitive to change. The findings were generally consistent with the hypothesized model. After controlling for intervention-targeted parenting behavior effects, there was only a small direct effect on the general child management measure for mothers and no direct effect for fathers.

A latent construct structural equation modeling approach (see Spoth, this volume) has also been employed to evaluate intervention outcomes (Spoth et al., in press). Thirteen ICMS subscale items measuring parenting dimensions similar to those described earlier were used to construct three scales serving as indicators of general child management. Observational measures of standard setting and consistent discipline from the Iowa Family Interaction Rating Scales (Melby et al. 1991) were

also used as indicators of the latent variable construct. Indicator item scores were averaged for mothers and fathers. The alpha reliabilities for the three ICMS subscales were 0.68, 0.72, and 0.74, respectively. The combined measurement model showed an acceptable fit with the data and was equivalent across experimental groups and across time. Findings supported the construct validity of general child management. As expected, intervention effects on this construct were primarily indirect. The construct validity of the composite general child management measure has also been supported through a test of a model of protective family processes (Spoth and Redmond 1996).

CONCLUSIONS

As previously stated, the authors' goal was to assist researchers in selecting promising measures of parenting practices for assessing the outcome of family-based prevention interventions. First, the authors delineated a series of issues relevant to the selection of appropriate measures for evaluating family-based prevention interventions. These issues included theoretical constructs and objectives of the intervention, population and developmental period of interest, methods and informants, psychometric properties, and additional issues related to longitudinal assessment. The evaluation of these issues by the individual researcher will, to a large extent, guide the selection of measures that are the most appropriate for addressing a particular research question.

Second, the authors provided examples of several sets of measures of parenting practices that appear promising because they meet reasonable psychometric criteria and have achieved some generalizability across research groups. Examples of observational systems, observer impressions, telephone interviews, in-person interviews, and parent questionnaires were all described, with attention to administration, variables assessed, psychometric properties, and adaptations.

Although the measurement of parenting practices has made great strides in recent years, sustained attention is still needed to continue to advance the field. Some of the most pressing issues in this regard are related to the cultural sensitivity of instruments, method variance, sensitivity to change in parenting practices, the fragmentation of the family and its implications for assessment, and longitudinal assessment over different developmental periods. In addition, efforts to develop valid yet cost-

effective methods for assessing parenting practices in general populations must continue.

As discussed previously, the measures of parenting practices described in this chapter are "works in progress," as the field of family-based prevention interventions continues to evolve and mature. Researchers must both continue to improve upon these promising assessment measures and use them as springboards for the development of new measures if they are to advance their ability to assess the outcomes of family-based prevention interventions.

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ACKNOWLEDGMENTS

The material presented in this chapter is based on discussions at a meeting sponsored by NIDA on Measurement Issues for Family Prevention Intervention, which was held in Snowbird, UT, October 14 to 16, 1996.

NOTES

1. Some of the descriptions of specific measures are adapted from McMahon and Estes (1997).

2. This book is now out of print. Information regarding OSLC instruments can be obtained by contacting Kathy Jordan (E-mail address "kathyj@oslc.org" or on the OSLC home page: http://www.oslc.org).

AUTHORS

Robert J. McMahon, Ph.D.
Professor and Director of Child Clinical
Psychology Program
Department of Psychology
University of Washington
Box 351525
Seattle, WA 98195-1525

Carol W. Metzler, Ph.D.
Research Scientist
Oregon Research Institute
1715 Franklin Boulevard
Eugene, OR 97403-1983

Family Measures in Drug Abuse Prevention Research

Howard A. Liddle and Cynthia Rowe

INTRODUCTION

In October 1996, the National Institute on Drug Abuse (NIDA) Prevention Research Branch convened experts in family-based prevention and intervention for a workshop titled "Measurement Issues for Family Prevention Intervention." This 2-day symposium was devoted to the discussion and identification of outstanding family measures appropriate for use in studies of drug abuse prevention and intervention with youth. Researchers from the Oregon Social Learning Center (OSLC), the University of Miami's Center for Family Studies, the Oregon Research Institute, the University of Washington/Social Development Research Group, the University of Utah, and individual researchers from highly respected research institutions across the country came together to discuss the challenges and complexities of family measurement in prevention intervention research and to nominate measures that adhere to basic standards of measurement. The five goals and objectives of this symposium were to (1) improve research and measurement in family-based interventions for the prevention of substance abuse, (2) increase sharing of knowledge of the best measures by domains and the most common family change variables, (3) increase awareness of barriers to measurement and possible solutions, (4) encourage the use of common measures to increase the generalizability of results across studies and to make meta-analysis more feasible, and (5) increase sensitivity to cultural issues in measurements and increase the use of more valid and reliable measures with ethnic populations.

Following is a summary of the issues and challenges that were discussed, the measures that were nominated as appropriate and sound instruments for prevention interventions with families, and the recommendations that were made for the measurement of family relationships. These recommendations are not meant to be a "gold standard" in family measurement, and they are clearly not the only promising family measures. Nominations are based on the group's collective experiences with high-risk children and problem families from different ethnic and

socioeconomic backgrounds as well as the empirical literature in the field. These recommendations are meant to assist new and established investigators in their search for adequate measures of family characteristics and functioning.

OVERALL RECOMMENDATIONS

The Family Measures Group understood its charge to be the specification of recommendations on family instruments that it considered to be the most valid, reliable, and change sensitive for important family variables in contemporary prevention research. Clearly, given the variability and complexity involved in defining the term "family," this was a difficult task. Some of these challenges included multiple family forms and meanings of family, taking into account the different ways in which a family can be subdivided and measured, deciding on the most relevant dimensions of family life vis-a-vis prosocial and problem behavior development, and understanding and assessing families as part of an ecology that includes other social institutions with child socialization functions and influences. Considerable controversy and debate about these matters has occurred within conceptual (e.g., Do measures of family functioning exist with self reports only? [Fisher et al. 1985]; unit of study questions [choices over molar versus molecular levels of data][Christensen and Arrington 1987]), methodological (validity issues of measures without cultural sensitivity [McLoyd 1991]), and data-analytic (e.g., data aggregation, addressing data from group, and individual levels [Bray et al. 1995]) domains. The authors concurred with the need to divide the total group's resources so that the molar level topics of family and parenting could receive sufficient attention. Recent research would endorse the notion that family and parenting measurement areas are distinct and should be treated as such in making research recommendations of this kind (Dakof 1996).

Problems arose when conclusions were drawn about constructs that were conceptualized and operationalized in diverse ways by different researchers. Inconsistencies in variable labels in family-based research to date has made interpretation of results difficult; family factors such as attachment, relationship quality, and even more behaviorally defined constructs such as monitoring and other aspects of parental discipline have come to mean different things in various research circles (Liddle and Dakof 1995). More precision and specification in the

operationalization of the constructs of interest is critical in determining exactly which family variables are associated with child risk status and which aspects of the family environment are actually changing over the course of interventions. The group agreed that the adoption of common measures by different research groups is one avenue toward standardization of construct definition and family measurement.

The group emphasized the need to be informed by the context of the task. That is, measure recommendation or selection is done in a context of specificity, and what is best depends on the circumstances and the boundaries of the task. First, the theory of family and the theoretical framework that the researcher has adopted for studying families need primary consideration. Measure consideration and selection is also done with careful consideration of the population variations that might be present in the study to be conducted (e.g., cultural and ethnicity variations and previous demonstrations of the instrument's usefulness and validity with the population in the study). The purposes of the study are inextricably linked to measure consideration and selection. For example, measurement decisions might be based on the need to assess change in particular domains of the family as a result of interventions. Additionally, the nature of the interventions themselves are critical to consider in measure selection.

Interventions focusing on changing family interactions within the family, family interactions of key family members vis-a-vis extrafamilial members, and interventions intent on changing belief systems may require different measure strategies or methods. As Bray (1995) suggests in the introduction to the *Journal of Family Psychology* Special Section on methodological advances in family psychology research, measurement of change in family-based interventions is a complex matter.

> Research on family psychology interventions faces problems common in other clinical psychology outcome research, with the ultimate goal being to determine which treatments are most effective. However, family psychology interventions are complicated by the fact that psychopathology is not viewed as being within an individual, but rather treatment usually focuses on multiple individuals, their interactions, and at times the social context of the interactions (e.g., school, hospital). Thus, the outcome of a successful treatment is measured not only by the change in the behavior of an identified patient but also in the interactions that are

related to the problem behavior. This is not a minor or simple issue (Bray 1995).

Furthermore, the decision to employ measures needs to be guided by considerations of the sensitivity and validity of the instrument with family members at different developmental stages. Researchers within the specialty of developmental psychopathology (Achenbach 1990; Cicchetti 1993; Sroufe and Rutter 1984) have inspired major advances in the ways in which adaptation is conceptualized over time, rather than reliance on the traditional conceptualization of dysfunction as a static condition. However, researchers have much to learn about the measurement of family relationships, the impact of parenting techniques, and the perceptions of family members with children at various developmental levels. This issue is particularly salient in intervention research, given that natural developmental processes occur conjointly with changes initiated within the intervention. Results of longitudinal studies tracking cohorts over the entire developmental span, such as the work currently being conducted at OSLC, will shed light on the suitability of instruments and the measurement of different child and family characteristics with individuals at different ages and developmental levels.

The group stressed the need to consider the assessment domain of the family as a complex and varied phenomenon and the need to be clear on which particular aspects of the family are of interest to the researcher (which, of course, follows the previous point about the consideration of family assessment measures in the context of particular studies, with specific questions, and certain populations in mind). Questions about best measures, as with all other aspects of research, are answered according to the way they are posed. Best measures of family are thus defined according to what is best for the kind of study and the particular dimensions and populations of interest.

Following this point, the group emphasized the heterogeneity that now exists in the family measurement specialty. Family research scientists have articulated a range of challenging conceptual, methodological, and data analytic issues (Bakeman and Casey 1995; Bank and Patterson 1992; Bray 1995; Cook 1993; Floyd et al. 1989; Gottman and Rushe 1993; Pinsof 1992). These challenges have been contextualized according to the specific aims of any given research inquiry. For example, some research questions may best be answered using self-report measures completed by multiple family members or members of

the dyad of interest in a particular study (e.g., mothers and adolescents). Other studies, such as those that seek to understand the interactional processes that occur at critical developmental periods and how these interactional patterns may be transformed as a result of a particular intervention (e.g., conflict, negativity, poor problemsolving ability,) may require an entirely different measure strategy. Here, family interaction task measures, long a staple tradition in family measurement and family research, may be the instrument that fits best with the study's objectives. Observational coding systems are used to capture a variety of important family constructs in prevention and intervention research. For example, the family relationship construct within an observational tradition includes support, bonding, involvement, cohesion, attachment, relationship quality, closeness, and affective realm (overall valence of positiveness or negativity). Measurement systems such as the Family Process Code of the OSLC research group (Dishion et al. 1983, 1984), the Defensive and Supportive Communications Coding System (Alexander 1973), and the Structural Family Systems Ratings of Szapocznik and associates (1985) assess many of the aforementioned dimensions by training expert raters to code family interactions. The observational versus self-report debate continues in the field, and some recent empirical work suggests that each perspective offers a unique source of information about family relationships (Cook and Goldstein 1993).

Issues related to striving to attain the ideal of the convergent validity between self-report and observational measures were discussed at length. Researchers from OSLC (Dishion et al. 1996) used a confirmatory factor analytic strategy to show that child reports, parent reports, and observer ratings of parenting constructs converge significantly, with problemsolving showing the highest level of convergence. However, each method also appeared to contribute unique variance to the measurement of parenting dimensions. The authors suggest that the method effects uncovered when different sources (child, parent, and observer) report on family or parenting dimensions are potentially meaningful and may differentially predict varying child outcomes. Continued investigation of method variance and the validity of self-report and observational methods in family measurement is an area of critical importance.

Following from this line of discussion, there was strong endorsement from the group of the multimethod, multi-informant, multidomain tradition, pioneered by such research teams as OSLC. The multitrait-

multimethod approach of this research team has demonstrated the dangers of building theory and testing interventions by using a single or narrowly conceived measurement strategy (e.g., mother's report on child outcomes). Significantly, they have modeled a measurement tradition in the area of family measurement that is exemplary in its attention to theory construction and intervention testing using multiple measures of the construct in question. The group discussed the importance of a researcher's framework for making measurement decisions. The researcher's framework would take into account key dimensions of measurement decisionmaking such as the data source (since there are multiple members of and, thus, perspectives on family functioning, which may come from outside of the family, such as raters of family functioning [in the form of family interaction]), and the nature or type of data to be collected from the data source. Table 1 is an example of a framework derived from group discussion.

TABLE 1. *Researchers' framework.*

Source of Data	Type of Data	Construct	Measure
Youth	Self-report	Problem behavior	Youth Self-Report
Siblings	Self-report	Family positives (attachment, parent, or family support)	
Parent	Self-report	Child behavior	Child Behavior Checklist
Teacher	Self-report	Child behavior	Teacher report (Oregon Social Learning Center)
Parent-youth relationship	Observational	Relationship process and communication	Defensive and Supportive Communication Coding System

Examples of other data sources include peers, interviewers, and the intervener's perspective; examples of other methods include physiological measures (e.g., urine screens), school (grades/attendance records), juvenile justice (arrest/adjudication history), and health, and mental health records (placement history).

Choosing Appropriate Family Measures

Change Sensitivity of Family Measures. In studies that attempt to demonstrate change in family functioning as a result of a prevention intervention (which could be defined either in multiple self-report terms or in interactional terms [observers' ratings of changes in family interactional patterns]), it is critical to consider the change sensitivity of the measure and the extent to which the measure in question has been used in other intervention studies. Self-report measures that have shown promise in this area include the Family Environment Scale (FES) (Moos and Moos 1974) and the Conflict Behavior Questionnaire (Prinz 1976). Both of these measures have been widely used in prevention and intervention studies with clinical families and have shown sensitivity to change from pretest to posttest. The Parent Daily Report (Oregon Social Learning Center 1984), which obtains information from the parent on the child's daily behaviors and the parent's reactions to these behaviors, has demonstrated change sensitivity with clinical families. The advantage of this measure is that it is a daily inventory of the child's behavior that takes only 10 to 15 minutes to complete and can provide a great deal of information about changes in the child's behavior over the course of and as a result of interventions. Researchers are interested in measuring short-term gains that occur within various phases of the intervention, changes that take place from intake to the end of treatment, and maintenance of treatment gains at followup points months and years after the intervention.

Observational coding systems that have demonstrated sensitivity to change in intervention studies include the Structural Family Systems Rating Scale (Szapocznik et al. 1985), the Family Process Code (Dishion et al. 1983), and the Defensive and Supportive Communication Coding System (Alexander 1973). The advantage of the Defensive and Supportive Communication Coding System is its ability to detect family changes that are associated with specific interventions within treatment.

Administration Issues and Psychometric Properties of Family Measures. The extent of the measures' development, their use in more than one or two research sites (particularly, use in sites other than the site at which it was first developed), and practical considerations should not be omitted in measure selection. The group nominated measures that have been used or are being incorporated into research programs at multiple sites, such as the FES (Moos and Moos 1974), the National Youth Survey (Elliott et al. 1985), and the Conflict Behavior

Questionnaire (Prinz 1976). The use of measures with different samples who present with varying clinical problems and are assigned to a range of interventions provides evidence for its flexibility and its external validity. Particularly relevant to drug abuse prevention research is the previous use of these measures with high-risk ethnically diverse samples. Measures that have been extensively developed and used in a number of controlled studies are the most promising instruments available, offering information on psychometric properties, standard scores, and possibly cultural sensitivity.

Ease of administration (i.e., understandable to subjects, cost of training administrators of the measure), subject burden issues, and cost should also be factors in selecting appropriate measures. These issues are particularly relevant given the importance of gathering as much information as possible from different sources, and the potential cost and time of such comprehensive assessments (the multitrait-multimethod approach). The measures were chosen for use only if they demonstrated adequate psychometric properties with representative samples of youth and their families. For the most part, the authors present adequate reliability estimates on the scales and measures. The establishment of the validity of the instruments is an important area of improvement in future studies. Table 2 presents the current established psychometric properties of the measures. Internal consistency estimates, test-retest reliability scores, and interrater reliability figures on the instruments tend to be moderate to high, with some scales and measures lacking important information concerning these issues.

Cultural Sensitivity of Family Measures. Perhaps the area of greatest concern and slowest progress in family measurement is the establishment of cultural sensitivity of available research instruments. Despite some excellent work in the area (Tolan et al. 1996*a*), very little is known about the differences in family conflict, parent-child relationships, and parenting behaviors in families of different ethnic and cultural backgrounds. This is in part due to the fact that the measures used in the majority of studies with problem children and their families have been developed and normed with mainly white middle-class samples. Researchers studying disadvantaged and minority samples have generally applied these measures without knowledge of the validity of these instruments with different populations. Attempts have been made to design measures with specific regard to cultural issues and themes (Szapocznik et al. 1985; Taylor 1996) and to develop measures targeting inner-city minority families (Gorman-Smith et al. 1996*b*). In addition,

well-established measures are being validated in prevention and intervention studies with different populations (Sugland et al. 1995; VanHasselt et al. 1993). When issues of culture and ethnicity are taken into account, it is almost always in the study of African American and Hispanic families; the state of the field today is even less aware of the unique issues of other minority groups such as Native American and Asian American groups. Greater consideration of cultural issues is paramount in conducting prevention and intervention research with drug-abusing and delinquent youth.

Domains of Measurement in Drug Abuse Prevention Research

Family Factors and Adolescent Drug Use and Abuse. Researchers have made significant progress in identifying family factors that predict problem behaviors during childhood and adolescence (Hawkins et al. 1992). Family conflict and the quality of family relationships have been shown to be important factors in the development of problems during childhood and adolescence and were specified by the group as critical domains of measurement. Appropriate self-report measures of family conflict that have been used successfully in clinical trials with problem children and adolescents are the conflict scale of the FES and the Conflict Behavior Questionnaire. Both self-report measures have been widely used in research programs and have been cited in published studies. The Family Process Code and the Defensive Supportive Communication Coding System are observational measures that allow for assessment of the level of negative or conflicting interaction within the family. Each of these measures shows promise but has yet to be validated with minority families. Studies are currently being conducted at OSLC and the Center for Family Studies utilizing these instruments with more ethnically diverse samples.

Family relationship variables of interest in prevention intervention research with families include organization, emotional support, attachment relations, and level of disengagement. The OSLC Parent Interview and Parent Daily Report provide information regarding the parent's perceived quality of the relationship with the child and show promise as measures of family organization. Two scales from the Social Development Research Group's Student Survey, which was designed to measure risk and protective factors for substance abuse and delinquency during adolescence, measure family relationship variables: family attachment and opportunities for positive involvement. The Family

Relations Scale has been developed and used in prevention studies with disadvantaged inner-city minority youth to measure changes in cohesion, beliefs, and structure following treatment. The Family Assessment Measure shows promise in demonstrating changes in global functioning during treatment.

Adolescent Substance Use, Attitudes, and Influences. In addition, measurement of the adolescent's substance use and abuse, peer substance use, parent substance use, and family norms regulating the child's behavior are important constructs in the study of family prevention intervention research. The group nominated well-established measures of substance use developed for national studies: the Monitoring the Future Study, National Youth Survey, and National Household Survey on Drug Abuse. These survey instruments have been validated on national probability samples with norms from various ethnic groups; however, measures used with nonclinical samples need to be appropriately applied with clinical samples. Parent substance use and abuse has been measured using the Alcohol Dependence Scale and the OSLC's Parent Interview. The University of Washington's Social Development Research Group (Arthur et al. 1995) Student Survey includes scales that measure parental attitudes favorable to antisocial behavior and rewards for conventional involvement and is recommended as appropriate for prevention intervention studies. Table 2 provides details on specific aspects of the nominated measures as well as overall strengths and weaknesses of the instruments.

The Family Measures Group provided a positive forum to discuss pressing issues related to the study of prevention interventions with high-risk youth and their families. Despite the complexities of defining and measuring families and incorporating information from different members, as well as the questions about cultural sensitivity and change of some measures, the field has made significant progress. Identifying appropriate, change-sensitive measures is a critical step in the advancement of family intervention science.

TABLE 2. *Summary of recommended family measures.*

Area	Contents
Title:	**Family Environment Scale (FES)**
Authors:	Moos and Moos (1974)
Target Population:	Has been used to study a wide variety of family types with both normal and psychiatrically impaired children and adolescents
Ages:	All family members including children ages 11 and older
Variable Scales:	10 subscales (nine items each) within three family social climate dimensions: Relationship dimension: cohesion, expressiveness, conflict Personal growth dimension: independence, achievement orientation, intellectual-cultural orientation, active-recreational orientation, moral-religious emphasis System maintenance dimension: organization, control Oregon Research Institute (ORI) (Metzler et al. 1994) reports good results using seven items from the adolescents' FES as a general measure of positive family relations
Administration:	90-item, true-false self-report measure of individual family members' perceptions of the family environment; three separate forms: real, ideal, expectations
Barriers to Administration:	None

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Psychometric Properties:	Internal consistency of the 10 subscales ranges from 0.61-0.78; test-retest reliabilities range from 0.68-0.86 for 2 months and 0.52 to 0.89 for 12 months Adequately distinguishes normal and disturbed families, including families of delinquents vs. normal adolescents, drug abusers, families with young adolescents with behavior problems vs. normal adolescents, families with adolescent clients at a mental health clinic vs. nonclients ORI "Positive Family Relations" scale has shown internal consistencies of 0.81-0.86 with three separate samples
Languages:	English, Spanish, Czech, Chinese
Cultural Sensitivity:	Normed on several ethnic minority groups, including African-American families, a sample of Chinese families in Hong Kong, a sample of Czech families, and a sample of Spanish families
Subject Norms:	Standardized and normed on a sample of 1,125 normal (including single-parent families, multigenerational families, several geographic locations in the United States but predominantly higher socioeconomic class) and 500 distressed families (family member diagnosed with a psychiatric disorder); standard scores available from 1974 and 1981
Cost:	Self-scorable kit: $42.10; Manual (3d ed.): $40.10; Form R Item Booklets: $22.90; Form I and E Item Booklets: $34.30
Available From:	Consulting Psychologists Press, 3803 East Bayshore Road, Palo Alto, CA 94306 (800) 624-1765

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Key References:	Bischof et al. (1995) Dixon (1986) Fowler (1981) Friedman and Utada (1992) Friedman et al. (1991) Ma and Leung (1990) Metzler et al. (1994) Moos and Moos (1981) Moos and Moos (1984) Moos and Moos (1986) Reichertz and Frankel (1990) Robertson and Hyde (1982)
Strengths:	Theoretically based; standardized and normed; comprehensive manual available; items are easy to understand for respondents; has been successfully used to predict positive outcome in adolescent drug abusers and their families following family therapy
Weaknesses:	Limited information provided about standardization sample; does not provide information on dyadic or individual functioning within the whole family; true-false format may not provide an adequate range of responses
Comments:	Used by ORI (Hops), CFS/CRADA, OSLC (OYS), Ohio University (Gordon), Spoth, SDRG (adapted)
Title:	**Family Assessment Measure (FAM)-III**
Authors:	Skinner et al. (1984)
Target Population:	Designed as a diagnostic tool for both research and clinical work with problem and nonproblem families, a measure of therapy process and outcome, as well as an instrument for basic research on family processes
Ages:	All family members older than 10 or 12

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Variable Scales:	Three scales: general scale, dyadic-relationships scale, self-rating scale; family functioning is evaluated across seven dimensions: task accomplishment, role performance, communication, affective expression, affective involvement, control, values and norms (items reflecting each dimension appear within each of the three scales); social desirability scale and denial-defensiveness scale are also included
Administration:	Self-report scale completed by each family member; respondents must indicate how accurately each statement best describes their family (four possible responses: "strongly agree," "agree," "disagree," and "strongly disagree"); general scale: 50 items; dyadic-relationships scale: 42 items; self-rating scale: 42 items; administration time = 20 to 60 minutes
Barriers to Administration:	Completion of form can take up to 1 hour with larger families
Psychometric Properties:	Internal consistency for general scale: 0.93 for adults, 0.94 for children; dyadic-relationships scale: 0.95 for adults, 0.94 for children; self-rating scale: 0.89 for adults, 0.86 for children; scales significantly differentiate problem (family member seeking professional help) and nonproblem families
Languages:	English, Spanish, French
Cultural Sensitivity:	Unclear
Subject Norms:	Standardized on 475 families (933 adults, 502 children), fairly representative across socioeconomic status (no information on ethnicity); 28% were problem families (one or more members having sought professional help)

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Cost:	(As of April 1990): FAM Test Booklets (reusable): $ .50 each, FAM Answer Sheets (not reusable) $ .25 each, FAM Profile Sheets (for plotting FAM): $ .10 each, Brief FAM $ .25 each, FAM Administration & Interpretation Guide $2 each, FAM Starter Kit $7 each
Available From:	Dr. Harvey Skinner, Addiction Research Foundation, 33 Russell Street, Toronto, Ontario, Canada M5S 2S1 Forward orders directly to: FAM Project Coordinator, Addiction Research Foundation, 33 Russell Street, Toronto, Ontario, Canada M5S 2S1
Key References:	Skinner (1987) Skinner et al. (1983) Skinner et al. (1984) Steinhauer (1984) Steinhauer et al. (1984)
Strengths:	Easy to administer and score; profile forms allow for clinical interpretation of data; normative data and interpretive guidelines are available; three-level analysis of family functioning provides a unique contribution to family process measurement
Weaknesses:	Limited reliability and validity data
Comments:	Used by CFS (Liddle and Szapocznik)
Title:	**Conflict Behavior Questionnaire (CBQ)**
Authors:	Prinz (1976); Prinz et al. (1979)
Target Population:	Adolescents and their families
Ages:	10-18

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Variable Scales:	Appraisal of the other and appraisal of the dyad, reflecting levels of distress family members experience as a result of their interactional patterns (adolescent from two-parent family receives scores on perceptions of both mother and father as well as perceptions of the dyads with mother and father separately)
Administration:	75-item (73-item for adolescents) true-false self-report measure completed by parents and adolescents; shorter forms (44-item and 20-item) are available that are highly correlated with the longer form
Barriers to Administration:	None; quick and efficient to administer and score
Psychometric Properties:	Internal consistency (coefficient alphas): 0.88 for mothers' report on adolescents, 0.90 for mothers' report on dyad, 0.95 for adolescents' report on mother, 0.94 for adolescents' report of dyad; percent of parent-adolescent agreement on similar items is 67% for distressed families and 84% for nondistressed families; test-retest correlations over 6-8 weeks: 0.57-0.61 for mothers and 0.85 for fathers; all scores have been found to discriminate distressed and nondistressed mothers, fathers, and adolescents; ORI reports excellent construct validity and Cronbach's alphas between 0.78 and 0.80 using 11 items from the child's report of CBQ (plus one item from the FES) to measure family conflict
Language:	English
Cultural Sensitivity:	Questionable, given that norms are not available for minority samples
Subject Norms:	Authors report that "preliminary norms" are available for distressed and nondistressed adolescents and parents (Robin and Foster 1984)—sample of white, middle-class urban and suburban families
Cost:	None

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Available From:	Sharon Foster and Arthur Robin; actual scales and scoring procedures available in Foster and Robin (1988)
Key References:	Ary et al. (in press) Foster et al. (1983) Foster and Robin (1988) Metzler et al. (1994) Prinz (1976) Prinz et al. (1979) Robin and Foster (1984) Robin and Foster (1989)
Strengths:	Easy to administer and easy for subjects to complete; sensitive to treatment effects (skills training) over time in a sample of high-conflict families
Weaknesses:	True-false format may restrict the range of possible responses
Comments:	Used by CFS (Liddle and Szapocznik), ORI
Title:	**Family Relations Scale**
Authors:	Gorman-Smith et al. (1996*b*)
Target Population:	Urban, ethnically diverse families with delinquent and drug-abusing children and adolescents
Ages:	Mainly used with young adolescents
Variable Scales:	Six scales: beliefs about the family (two subscales: importance of family relationships and beliefs about development); emotional cohesion; support; communication; shared deviant beliefs; organization
Administration:	35-item self-report measure completed by parent and adolescent
Barriers to Administration:	None

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Psychometric Properties:	Internal consistencies (alpha reliability coefficients) range from 0.58 (communication) to 0.86 (beliefs about the family); factor structure of the scales indicate the following average alpha calculations for each scale: beliefs about the family: 0.92 (mother), 0.69 (child); cohesion: 0.69 (mother), 0.80 (child); support 0.75 (mother), 0.58 (child); organization 0.57 (mother), 0.57 (child); shared deviant beliefs 0.80 (mother), 0.71 (child)
Languages:	English, Spanish
Cultural Sensitivity:	The measure was developed specifically to provide an accurate measure of the functioning of ethnically diverse urban families, thus it is particularly promising as an appropriate and culturally sensitive instrument for currently underserved and poorly understood disadvantaged families; a panel of experts on African-American and Latino cultural issues reviewed and revised the instrument during its developmental stage
Subject Norms:	Unavailable; scale is being validated and normed in ongoing studies
Cost:	None
Available From:	P.H. Tolan, University of Illinois Institute for Juvenile Research
Key References:	Gorman-Smith et al. (1996*a*) Gorman-Smith et al. (1996*b*) Tolan et al. (1996*a*) Tolan et al. (1996*b*)
Strengths:	The measure is a promising tool for both clinical and research endeavors with ethnically diverse urban families with young problem adolescents, and high-risk, inner-city samples

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Weaknesses:	The measure has yet to be adequately validated and tested in different research settings; has not been used with older adolescents
Comments:	Used in the Chicago Youth Development Study, CFS (Liddle, Szapocznik)
Title:	**Structural Family Systems Rating Scale**
Authors:	Szapocznik et al. (1985)
Target Population:	Adolescents with behavior problems and drug abuse and their families
Ages:	Appropriate for assessing families with children as young as 6 years old
Variable Scales:	Structure, resonance, developmental stage, identified patienthood, and conflict resolution, as well as a total score; subscale scores of parental alliance, parental leadership, and conflict resolution
Administration:	Observation-based measure of family interaction that uses standardized administration and scoring procedures Two steps: (1) administer the standardized family tasks (about 20 minutes) and (2) conduct the structural family systems ratings (about 30 minutes)
Barriers to Administration:	Training of raters is potentially time intensive
Psychometric Properties:	Authors report intraclass correlations indicating interrater reliabilities of 0.84 for total score and ranging from 0.48 to 0.86 on the dimensions of functioning; internal consistency of the total score is 0.87; interdimensional internal consistencies range from 0.69 to 0.89 (averaging 0.80); 1-month interval reliability checks performed by the same rater range from 0.83 to 0.98 along the scales

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Languages:	Spanish, English
Cultural Sensitivity:	Developed for use with Hispanic families
Subject Norms:	Validated with over 500 clinical families
Cost:	None
Available From:	Jose Szapocznik, Ph.D., Center for Family Studies, Department of Psychiatry and Behavioral Sciences, University of Miami School of Medicine, Miami, FL
Key References:	Szapocznik and Kurtines (1989) Szapocznik et al. (1985) Szapocznik et al. (1986) Szapocznik et al. (1990) Szapocznik et al. (1991) Szapocznik et al. (1989*a, b*)
Strengths:	Unique contribution to the integration of structural family theory, therapy, and assessment; efficient in terms of administration and time; useful as both a treatment evaluation instrument and diagnostic tool
Weaknesses:	Training of raters may be labor intensive and time intensive
Comments:	Used by CFS (Szapocznik, Santisteban)
Title:	**Defensive and Supportive Communications Coding Manual (DSC)**
Authors:	Alexander (1973)
Target Population:	Developed with delinquent and substance-abusing youth and their families; however, it is also appropriate to use as a measure of supportive and defensive communications in family therapy with more adaptive families

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Ages:	Family members of all ages
Variable Scales:	Generic measure of communication, relationship process, and conflict/negativity in families Supportive: positive affection, empathy, positive interpretive, restatement, agreement Defensive/Pejorative: superiority/demanding, blaming/critical, sarcasm, disagreement, restatement, agreement Structuring: therapy-related exchange, control in therapy, requests for action, directing the flow
Administration:	Administration is very flexible; coding system is used on segments of therapy; has been used to analyze thought units, speech acts, and time intervals; coders (undergraduate level) require approximately 1 month of training; coding requires approximately one-half hour for each 10-minute segment of interaction
Barriers to Administration:	Training and coding may be time intensive, but less so than other coding systems
Psychometric Properties:	Interrater reliability established at 0.76-0.94; convergent and discriminant analyses have established support for the internal structure and validity of the measure Successfully discriminates delinquent and nondelinquent youth and their families, as well as adaptive and dysfunctional families
Language:	English
Cultural Sensitivity:	Measure has been used with African-American and Hispanic families with drug-abusing youth
Subject Norms:	Not available
Cost:	None
Available From:	Dr. James Alexander, Department of Psychology, University of Utah, Salt Lake City, UT

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Key References:	Alexander (1973) Alexander and Barton (1994) Alexander et al. (1976) Alexander et al. (1995) Alexander et al. (1989) Barton et al. (1988) Mas et al. (1991) Newberry et al. (1991) Waldron et al. (1994)
Strengths:	This coding system is extremely flexible; training of raters is possible without excessive investment of time; it serves as one of the only valid measures of family process during therapy
Weaknesses:	Only measures one indicator of family process (negativity)
Comments:	Used by CFS/CRADA (Liddle et al.), Alexander and colleagues
Title:	**Family Process Code (FPC)**
Authors:	Original Family Interaction Coding System based on work by Reid (1978) and Patterson et al. (1969); Dishion et al. (1983, revised 1987)
Target Population:	Preadolescent antisocial children and their parents (families with high levels of aversive events and exchanges)
Ages:	Families with children 6-12 years of age; also used in prevention studies with young adolescents
Variable Scales:	Three dimensions: activity, content and valence Activity: work, play, read, eat, attend, unspecified Content: (25): 9 positive, 9 negative, 7 neutral; verbal, vocal, nonverbal, physical, compliance Valence: exuberant, positive, neutral, negative, unrestrained negative, sad affect

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Administration:	Families are observed in the home for 10-minute segments (trials) of interaction; in each trial a different family member is the focal subject and coding is restricted to that member's behaviors and interactions Families are oriented and prepared for the interaction and asked ahead of time to have all family members present and not to have visitors; entire administration takes about 60 minutes The FPC has also been used in the lab with a 25-minute structured interaction task involving a 5-minute warmup task in which the family plans an activity, and two 10-minute sessions in which the family discusses topics identified by parent and child beforehand as "hot" topics
Barriers to Administration:	Home observation can be difficult (portable equipment can be costly); distractions are more likely than in the lab
Psychometric Properties:	Original FICS: average interrater reliability 75%; code/code agreement ranged from 54% to 96%; codes shown to be stable across observers and over time (most variance attributable to subjects and subject X occasion interaction); measure clearly differentiates normal and clinic families; significantly correlated with self-report measure of family interaction (Parent Daily Report) FPC with 9- to 10-year-old boys (Dishion 1990): interobserver reliability of entire FPC code, 73.4%; average kappa, 0.52; parent discipline yielded alpha coefficients of 0.75-0.77 (mothers) and 0.74-0.82 (fathers); test-retest reliability of combined two-parent discipline, 0.68 FPC with 10- to 14-year-olds (Dishion and Andrews 1995): interrater reliability for content, 86.4%; affective valence, 73.4%; overall weighted kappa of 0.69 reported on combined content and valence of each entry (ranging from 0.37-0.78)

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Language:	English
Cultural Sensitivity:	Unclear
Subject Norms:	FICS and FPC normed on both normal and clinic boys and girls (mean behavior rates)
Cost:	None
Available From:	Manual available from OSLC, 207 East Fifth Street, Eugene, OR 97401
Key References:	Dishion (1990) Dishion et al. (1983) Dishion and Andrews (1995) Dishion and Patterson (1992) Patterson (1982) Patterson et al. (1992) Reid (1978)
Strengths:	Developed specifically for use with clinic samples and designed to tap into coercive family processes; theoretically as well as empirically based manual development; has been used in a rigorous program of research that has followed conduct-disordered boys into adolescence
Weaknesses:	Designed and developed for children and preadolescents; not used as frequently with adolescents
Comments:	Used by OSLC
Title:	**Parent Daily Report (PDR)**
Authors:	Patterson et al. (1975); Patterson (1976); Chamberlain (1980); Dishion et al. (1984)
Target Population:	Parents of antisocial preadolescents and adolescents

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Ages:	Used in waves starting with 9- to 10-year-old boys through senior year of high school
Variable Scales:	Designed to measure the daily incidence of the child's problem behaviors, including involvement in substance use, deviant peer groups, other problem behaviors, as well as parents' monitoring and discipline practices (reactions to these problem behaviors) Child problem behaviors, monitoring, limit setting, relationship quality, positive reinforcement
Administration:	Research assistant makes telephone calls to parent on 10 consecutive days or every other day for about 1 week at baseline (administration procedure can be modified to meet specific demands of each study); checklist takes about 10 minutes to complete
Barriers to Administration:	Potential difficulties contacting families on a daily basis
Psychometric Properties:	Distinguishes children in abusive families and nonabusive matched controls (Reid et al. 1987); across studies, PDR shows test-retest reliability ranging from 0.60-0.82, interobserver reliability ranging from 85% to 98%, concurrent validity with observational data collected using FPC in three separate studies (r, 0.48-0.69)
Language:	English
Cultural Sensitivity:	Measure used with predominantly European-American samples
Subject Norms:	Not available
Cost:	None
Available From:	OSLC, 207 East Fifth Street, Suite 202, Eugene, OR 97401

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Key References:	Chamberlain (1980) Chamberlain and Reid (1987) Chamberlain and Reid (1994) Dishion et al. (1984) Patterson (1976) Patterson et al. (1975) Patterson et al. (1978) Reid et al. (1987)
Strengths:	Access to daily information about the child's behavior may greatly improve the accuracy of parents' reports; ability to trace changes over time is critical in treatment efficacy studies, and this method allows for analysis of trends in behavior change throughout the treatment process
Weaknesses:	Cultural sensitivity not yet established
Comments:	Used by OSLC, adapted by ORI
Title:	**Parent Interview**
Authors:	Oregon Social Learning Center (1984)
Target Population:	Parents of preadolescent and adolescent antisocial children
Ages:	Used with boys from ages 9 to 10 to senior year of high school
Variable Scales:	Different sections of the interview include monitoring, relationship, family problemsolving, positive reinforcement, discipline, youth's chores, youth's self-esteem, performance expectations for youth, demographics, religious practices, parent tobacco use, youth's employment adjustment, youth's sexual behavior, youth's social adjustment, youth's use of free time

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Administration:	Interview takes approximately 45 minutes; interview can be modified depending on the type of study and questions of interest
Barriers to Administration:	None
Psychometric Properties:	3-month test-retest stability: monitoring, 0.70; limit setting, 0.65; relationship quality, 0.65; positive reinforcement, 0.57 Alpha coefficients: monitoring, 0.81; limit setting, 0.81; relationship quality, 0.85
Language:	English
Cultural Sensitivity:	Measure used with predominantly European-American samples
Subject Norms:	Not available
Cost:	None
Available From:	OSLC, 207 East Fifth Street, Suite 202, Eugene, OR 97401
Key References:	Dishion and Kavanagh (in press) Dishion et al. (1996) Patterson et al. (1992) Patterson et al. (1975) Patterson et al. (1978)
Strengths:	Flexibility of instrument; developed with problem children and preadolescents
Weaknesses:	Cultural sensitivity not yet established
Comments:	Used by OSLC, ORI, CFS (Szapocznik)

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Title:	**Family Participation Factor Scales**
Authors:	Spoth and Redmond (1993*a, b*; 1995; Spoth et al. 1996); Social and Behavioral Research Center for Rural Health, Center for Family Research in Rural Mental Health, Iowa State University
Target Population:	Parents of children and adolescents potentially benefiting from participation in prevention services
Ages:	Used in samples of families with fifth, sixth, and seventh graders
Variable Scales:	A series of scales assessing factors that might influence family participation in family-focused interactions and related research activities
Administration:	Likert-type items concerning factors influencing family member participation (e.g., requiring child care to attend meetings, weeknight meetings five consecutive nights, 10-mile trip to meetings, parental beliefs about interventions)
Barriers to Administration:	None
Psychometric Properties:	Alpha reliabilities
Language:	English
Cultural Sensitivity:	Used with predominantly white rural samples
Subject Norms:	Not available
Cost:	None

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Available From:	Richard Spoth, Institute for Social and Behavioral Research, Center for Family Research in Rural Mental Health, Iowa State University Research Park, Building 2, Suite 500, 2625 North Loop Drive, Iowa State University, Ames, IA 50010
Key References:	Spoth and Molgaard (1993) Spoth and Redmond (1993*a, b*) Spoth and Redmond (1995) Spoth et al. (1993) Spoth et al. (1996)
Strengths:	Important construct that is especially relevant to positive outcomes in family-based interventions and intervention research with troubled adolescents (barriers to participation)
Weaknesses:	Not been used with inner-city families who potentially have the most serious barriers to participation in family-based interventions; limited psychometric data
Comments:	Used by Spoth, Kumpfer
Title:	**Student Survey of Risk and Protective Factors and Prevalence of Alcohol, Tobacco, and Other Drug Use**
Authors:	Hawkins et al. (1995)
Target Population:	General population of students
Ages:	Students in grades 6, 8, 10, 12

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Variable Scales:	Family relationships: family attachment (six items), opportunities for positive involvement (three items), recognition/rewards for conventional involvement (two items) Family norms: history of antisocial behavior (six items); attitudes toward antisocial behavior (six items); attitudes favorable toward alcohol and other drugs
Administration:	Total instrument takes 40 minutes and is self-administered in the classroom
Barriers to Administration:	None
Psychometric Properties:	High concurrent validity with other drug and alcohol use and delinquency; reliabilities of each scale by State, gender, and grade (and overall): Family attitudes-ASB: 0.72-0.84 (State), 0.75-0.79 (females-males), 0.75-0.80 (grade) Family attitudes-ATOD: 0.78-0.82 (State), 0.77-0.80 (females-males), 0.75-0.80 (grade), 0.80 (overall) Family history-ASB: 0.72-0.76 (State), 0.72-0.74 (females-males), 0.70-0.75 (grade), 0.73 (overall) Family attachment: 0.84-0.85 (State), 0.84-0.86 (females-males), 0.83-0.84 (grade), 0.84 (overall) Family-OPI: 0.70-0.79 (State), 0.77-0.75 (females-males), 0 .72-0.77 (grade), 0.76 (overall) Family-RCI: 0.75-0.91 (State), 0.85-0.81 (females-males), 0.79-0.84 (grade), 0.86 (overall)
Language:	English

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Cultural Sensitivity:	Normed with different ethnic groups
Subject Norms:	Excellent standardization information available from over 100,000 students in Oregon, Kansas, Maine, South Carolina, and Washington
Cost:	$1.40 per full survey including all family, community, peer (cost includes printing of forms, shipping, scoring, and development of database)
Available From:	Developmental Research and Programs (800-736-2630)
Key References:	Authors report that one paper with data on the survey and results is under review in *Journal of School Health*; the following papers represent work leading up to development of the survey: Catalano et al. (1991) Hawkins and Catalano (1987) Hawkins and Catalano (1992) Hawkins et al. (1989) Hawkins et al. (1992)
Strengths:	Full survey is efficient and reliable among different ethnic groups (except Family Conflict scale); standardization done on wide range of children from various geographic locations
Weaknesses:	Family conflict scale is based on items from FES and should not be used given poor reliabilities among ethnic groups; not developed for or normed on clinic samples (only children who are in school)
Comments:	Used by University of Washington Social Development Research Group (Hawkins and colleagues)

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Title:	**National Youth Survey**
Authors:	Elliot et al. (1985)
Target Population:	General population of junior high and high school students
Ages:	Used in studies of national samples with individuals ages 11 to 17; followups with individuals up to age 33
Variable Scales:	Major scales: sociodemographics, strain, internal (personal) controls, external controls, normative orientation of institutions/groups, sanctioning networks, delinquent/criminal behavior, substance use, problem substance use, official justice system contacts, victimizations, sexual behavior, mental health, domestic violence Subscales of interest: Problem alcohol use, problem drug use, problem marijuana use, attitudes toward deviance, attitudes toward substance use, attitudes toward delinquency/crime, general delinquency, peer substance use; peer delinquency, peer pressure for substance use; peer involvement, quality of peer bond
Administration:	Self-report measure is administered in group setting such as the classroom or individually with adolescent; 45-minute administration time
Barriers to Administration:	None
Psychometric Properties:	Internal consistencies of the scales: problem alcohol use, 0.73; problem drug use, 0.68; problem marijuana use, 0.65; attitudes toward deviance, 0.82; attitudes toward substance use, 0.79; attitudes toward delinquency/crime, 0.86; general delinquency, 0.75; peer substance use, 0.78; peer delinquency, 0.79; peer pressure for substance use, 0.73; peer involvement, 0.76; quality of peer bond, 0.73

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Language:	English
Cultural Sensitivity:	National probability sample includes individuals from different ethnic groups
Subject Norms:	Information available from eight waves (14 years) of the National Youth Survey (N=1,172); national probability sample from all geographical locations in the United States
Cost:	None
Available From:	Behavioral Research Institute, Boulder, CO 303-492-1266
Key References:	Elliott et al. (1983) Elliott et al. (1985) Elliott et al. (1989) Esbensen and Elliott (1994)
Strengths:	Used in a wide range of studies with both clinic and "normal" adolescents; national norms available over a 14-year period for different ethnic groups; easy to administer and score
Weaknesses:	Originally designed for use in national probability studies, therefore the higher ranges of delinquency seen in clinical samples may be restricted
Comments:	Used by OSLC (OYS), Spoth, CFS (Liddle and Szapocznik), Gordon
Title:	**National Household Survey on Drug Abuse**
Authors:	Melnick; Substance Abuse and Mental Health Services Administration (SAMHSA)
Target Population:	Designed to measure the use of illicit drugs in the general U.S. population of individuals

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Ages:	12 and older
Variable Scales:	Past-month use, past-year use, and lifetime use of the following drugs: marijuana, cocaine/crack, inhalants, hallucinogens/PCP, heroin, prescription drugs, alcohol (heavy alcohol use), cigarettes, smokeless tobacco
Administration:	Measure is generally administered as an in-person interview including self-administered items; entire interview takes about 1 hour
Barriers to Administration:	Length of entire interview may not be suitable in large research protocols with many measures
Psychometric Properties:	Not reported
Languages:	English, Spanish
Cultural Sensitivity:	Administered and normed on a random sample of the U.S. population, including major ethnic groups
Subject Norms:	National norms available by gender, ethnic group, geographical location (no norms for clinical groups)
Cost:	Not reported
Available From:	SAMHSA, Office of Applied Studies, 5600 Fishers Lane, Room 16C-06, Rockville, MD 20857 301-443-7980
Key References:	Greenblatt et al. (1995) Johnson et al. (1996) Substance Abuse and Mental Health Services Administration (1993*a, b*; 1994; 1995*a, b, c;*1996*a, b, c*)

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Strengths:	National norms available on individuals in major ethnic groups, geographical locations, and SES classes
Weaknesses:	Not designed as a measure for clinical populations and may not be sensitive to more severe use
Comments:	Used by ORI (Hops)
Title:	**Monitoring the Future Survey**
Authors:	Johnston et al. (1975-present)
Target Population:	Designed to study changes in the attitudes and beliefs of the Nation's high school students and to monitor trends in drug use among the Nation's youth
Ages:	Originally designed for use with high school seniors; now administered to 8th and 10th graders as well; followup surveys done with each cohort every year into their early thirties
Variable Scales:	Cigarette use, alcohol use, marijuana use, other illicit drug use, perceived harmfulness of drugs, personal disapproval of drug use, attitudes regarding the legality of drug use, perceived attitudes of parents and friends, friends' use of drugs, perceived availability of drugs
Administration:	Can be group administered in the school setting (self-administration possible)
Barriers to Administration:	None

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Psychometric Properties:	Authors report reliability estimates from three waves of longitudinal data: 0.89-0.91 for cigarette use (past 12 months); 0.86-0.91 for cigarette use (past 30 days); 0.84-0.89 for alcohol use (past 12 months); 0.72-0.78 for alcohol use (past 30 days); 0.89-0.91 for marijuana use (past 12 months); 0.78-0.84 for marijuana use (past 30 days); 0.70-0.87 for other illicit drug use (past 12 months); 0.49-0.72 for other illicit drug use (past 30 days); annualized stability estimates on followup surveys: 0.92-093 for cigarette use (both past 12 months and past 30 days); 0.88-0.91 for alcohol use (past 12 months); 0.86-0.88 (past 30 days); 0.88-0.90 for marijuana use (past 12 months and past 30 days); 0.81-0.90 for other illicit drug use (past 12 months); 0.76-0.82 (past 30 days)
Language:	English
Cultural Sensitivity:	National samples include individuals from all major ethnic groups in the United States
Subject Norms:	National norms available for high school seniors each year since 1974; norms available on 8th and 10th graders since 1991; norms also available for young adults as followups of the original samples
Cost:	Not available for sale
Available From:	Survey instrument not available for use; can be adapted for use in a study; contact Survey Research Center, 1355 Institute for Social Research, P.O. Box 1248, Ann Arbor, MI 48103 313-763-5043

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Key References:	Bachman et al. (in press) Bachman et al. (1991) Johnston et al. (1995) Johnston et al. (1996*a, b*) O'Malley et al. (1983) O'Malley et al. (1993) O'Malley et al. (1995) Schulenberg et al. (1994) Schulenberg et al. (1996*a, b*) Wallace and Bachman (in press)
Strengths:	National norms available on high school students and young adults each year from 1974
Weaknesses:	May not be sensitive to levels of use in clinical populations; norms are not available for individuals with higher levels of use (clinical populations)—norms are also not applicable to samples in which many of the subjects do not attend school
Comments:	Serves as the standard for measurement of adolescent drug use and establishment of national high school norms
Title:	**Alcohol Dependence Scale (ADS)**
Authors:	Skinner and Horn (1984)
Target Population:	Designed to measure the severity of alcohol dependence among clinical groups of adult substance abusers and incarcerated offenders
Ages:	Has been used with adult populations aged 20 to late forties
Variable Scales:	Adapted from the Alcohol Use Inventory by Horn and Wanberg (1969), incorporating four scales from the original measure: loss of behavioral control, psychophysical withdrawal, psychoperceptual withdrawal, and obsessive-compulsive drinking

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Administration:	25-item self-report scale that can be administered in questionnaire or interview format; takes less than 10 minutes to complete; computerized version available
Barriers to Administration:	None
Psychometric Properties:	Reliability and validity data are based on the original 29-item scale, which correlates highly with the 25-item scale (r, 0.96-0.99); internal consistency of the measure is reported between 0.85 and 0.94 with various samples; correlates with other measures of alcohol abuse and dependence, including the MAST and DSM-III diagnostic interviews
Languages:	English, French
Cultural Sensitivity:	No studies using the ADS with specific cultural groups
Subject Norms:	User's guide contains data and validation information from inpatient and outpatient clinical samples
Cost:	ADS Kit (user's guide and 25 questionnaires): $15.00; user's guide: $14.25; questionnaire: $6.25
Available From:	Addiction Research Foundation, ARF Marketing Services, 33 Russell Street, Toronto, Ontario M5S 2S1 800-661-1111 Fax: 416-593-4694 MKTG@arf.org
Key References:	Horn and Wanberg (1969) Kivlahan et al. (1989) Skinner and Allen (1982) Skinner and Horn (1984) Ross et al. (1990)

TABLE 2. *Summary of recommended family measures (continued).*

Area	Contents
Strengths:	Administration is quick and straightforward; designed and used with clinical adult samples
Weaknesses:	Cultural sensitivity not yet established
Comments:	Used by OSLC (OYS)

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AUTHORS

Howard A. Liddle, Ed.D.
Professor and Deputy Director

Cynthia Rowe, M.A.
Research Associate

Department of Psychiatry and Behavioral Sciences
Center for Family Studies
University of Miami
1425 NW 10th Avenue
Miami, FL 33136

Family-Based Prevention in Developmental Perspective: Design, Measurement, and Analytic Issues

Linda M. Collins and Michael J. Shanahan

In recognition of the potentially critical role the family plays in substance use, the National Institute on Drug Abuse (NIDA) is expanding its school-based prevention efforts to include the family. For the developmentalist, this new focus raises challenging methodological issues. These issues largely reflect paradigmatic interests in change and multilevel systems, themes that are common to numerous developmental approaches: ecological (Bronfenbrenner 1979), contextual (Lerner and Kaufman 1985), interactive (Magnusson 1988), individual-socioecological (Valsiner 1987), and the lifecourse (Elder and O'Rand 1995).

Since World War II, American family life has changed enormously. Demographers observe greater variability in the age at which marriages form, a decrease in fertility, and increases in marital dissolution; blended families; and alternatives to married living, including cohabitation and single-parent households (Cherlin 1988; Goldscheider and Waite 1991). Social theorists maintain that the family has changed from a constellation of socially defined roles to a primary group of individuals who negotiate their responsibilities and expectations, a pattern often seen in dual-earner families (e.g., Giddens 1992). Thus, researchers must be sensitive to the appreciable diversity that distinguishes contemporary "families," as well as how the family changes according to several different temporal frames implicating history, the stages of family life, and the life-histories of individual family members. What are the design, measurement, and analytic strategies that facilitate the study of these temporal complexities?

The study of the family is also complicated by its multilevel nature. Families are located within communities and neighborhoods having characteristics that are potentially relevant to the adaptive patterns of youth. These variables include job opportunities and the availability of social services (Furstenberg and Hughes, in press), the extent to which others assume responsibilities for monitoring children (Fletcher et al. 1995), and social disorganization as reflected in such factors as crime,

mobility, and the concentration of poverty (Sampson 1992). At the same time, individuals are located within families that have unique characteristics, including, for example, cohesion and the experience of negative family events. What is the relative importance of community, family, and individual-based variables and the interactions among them?

This chapter presents a concise overview of methodological issues confronting developmentalists interested in the study of drug abuse prevention in families. Issues of design, measurement, and analysis in the study of family prevention programs are considered, with special emphasis on the testing of dynamic and multilevel hypotheses.

DYNAMIC ASPECTS OF FAMILY PREVENTION RESEARCH

Family prevention research examines patterns involving substance use, family structure and relationships, psychosocial factors, and context—constellations of variables that are potentially dynamic (i.e., they are subject to change in systematic ways over time). Many of the methodological issues raised by the study of these phenomena stem from the use of longitudinal data. After a brief conceptual overview of some dynamic variables in family-based prevention, the authors discuss (1) prominent design issues including how families are sampled, missing data problems, and the number, timing, and spacing of observations; (2) measurement issues, including validity, factoral invariance, and reliability in longitudinal designs; and (3) statistical methods that are particularly valuable when studying longitudinal data, including latent growth-curve models, survival analysis, and latent transition analysis.

Dynamic Variables in Family-Based Prevention

Substance Use and Related Psychosocial Variables. Substance use and many closely related psychosocial variables figure prominently in prevention research. The use of individual substances changes across the lifecourse, as individuals start out as nonusers, experiment with a substance, and then in most cases develop a pattern of use, which may be abstinence, occasional use, more regular use, or dependence. Substance use onset may be thought of as a stage sequence made up of experiences with individual substances (Collins et al. 1994; Kandel and Yamaguchi 1985). For example, Collins and colleagues (1994) characterized the early-onset process as a sequence consisting of trying alcohol, trying

tobacco, and having a first experience with drunkenness before moving on to low-level advanced use.

Dynamic psychosocial influences on substance use may exert effects at any point in the lifecourse. Perceptions of peer use, normative beliefs, attitudes toward risk-taking, poor relationship with parents, and feelings of rebelliousness are all dynamic influences on substance use onset (Hawkins et al. 1992). Substance use in adults may fluctuate in response to external influences, such as work-related stress. Increased use of alcohol or prescription drugs by an elderly family member may stem from growing depression associated with a disability or the discomfort of a lengthy illness.

Family Structure: Role Set and Membership. In the late 1980s it was observed that roughly two of three marriages would end in dissolution (Martin and Bumpass 1989). Hofferth (1989) estimated that one-third of children born in the 1980s will still be living with both natural parents by age 14, while one-fourth will be living with a natural parent and a stepparent. These estimates suggested that about one-half of all children living with two parents will have one parent who is a late arrival. Furthermore, a plurality of children (exceeding 40 percent) will be in a single-parent household, most frequently with the mother. In short, a large percentage of American youth will live in a variety of intact and nonintact family types (Wojtkiewicz 1992).

Consider a hypothetical case consistent with these demographic trends: a household consisting of a wife, husband, and one son agrees to participate in a 5-year longitudinal study. At some point in the course of the study, the parents divorce and each remarries, with the son in joint custody. The mother now reports her family as her son and her new husband. The father now reports his family as his new wife, her two children from a previous marriage, and his son. The son began with a mother and father, but as the study comes to a close only 5 years later, he has a natural mother and father, a stepmother and stepfather, and two stepsiblings. Further complexity is likely if the study includes a substantial number of older adolescents. For example, the son may cohabitate with a companion or live in an institutionalized setting such as a dormitory.

Given the simplest case of family structure and membership—a family that remains intact through the course of a study—issues of the family cycle may still add considerable complication (Elder, in press). Family

cycle typically refers to the ordering and timing of stages traditionally associated with family life: courtship, engagement, marriage, first birth, the spacing of children, the departure of children from the home, and death of a spouse (Hill 1970). Many of these elements have uncoupled in sequence and timing in the past several decades (Cherlin 1993), creating great diversity in what constitutes "family life."

Context. Sociologists conceptualize the family as a set of relationships linking the individual with a changing society (Elder and O'Rand 1995; Furstenberg 1985). First, relatively discrete events such as wars and economic downturns can affect family life. For example, Elder's (1974) studies of the Great Depression demonstrate that economic decline frequently leads to marital tensions, poor parenting, and changes in children's psychological well-being, problem behaviors, and health-related behaviors. Studies of household income suggest that an appreciable number of families move in and out of poverty on a yearly or even monthly basis (Bane and Ellwood 1986; Ruggles and Williams 1989). Families may also experience an abrupt change in context because of geographic mobility. Roughly 18 percent of 15- to 19-year-olds experienced a move in a 1-year period beginning in 1990 (U.S. Bureau of the Census 1992). Long-term change may also have an impact on family life; changes such as economic restructuring, outmigration, and the reorganization of rural communities are relatively nondiscrete events that have dramatically transformed relationships within the family (Elder et al. 1993).

Design Considerations When Dynamic Variables Are Involved

In a series of articles on design for developmental research, Schaie (1965, 1973) and Schaie and Baltes (1975) point out that there are three broad classes of predictors of intraindividual change over time: age, cohort, and time. Age refers to the individual's chronological age at each observation; cohort refers to the birth cohort or generation to which an individual belongs; and time refers to the date that an observation is made on an individual. These are not independent, since any two of them determine the third. For example, an individual who is 65 years old (age) in 1995 (time) can belong to only the 1930 birth cohort, which means that this individual's development has been influenced by factors such as the Great Depression and World War II. The age-cohort-time distinction is particularly useful for highlighting the strengths and weaknesses of the two major design possibilities: cross-sectional and longitudinal.

In a cross-sectional design, all data are collected at a single time for all participants. If the primary focus of a study is group comparisons at one point in time, a cross-sectional design should probably be used. However, cross-sectional results may be misleading when individuals of different ages are compared. For example, a researcher may be interested in how attitudes toward substance use differ between generations. Suppose it is found that children have more permissive attitudes toward drug use when compared with their parents. It may be tempting to infer a developmental trend of decreasing permissiveness with age (i.e., parents have less permissive attitudes toward drugs because older people are less permissive than younger people). However, the cross-sectional approach confounds age and cohort: All of the individuals who are a particular age belong to a particular cohort. Thus, an alternative explanation is that the observed differences are due to cohort membership: Perhaps children are exposed to a more permissive culture today when compared with their parents' formative years. According to this explanation, as these children age, they will not become more permissive.

The ability to disentangle the age-cohort confound is one benefit to longitudinal designs. In the longitudinal approach, data are collected on individuals repeatedly across time. Longitudinal studies are more expensive and time consuming, but unlike cross-sectional studies, they offer the ability to observe intraindividual growth over time directly. One problem with traditional longitudinal designs is that only a single cohort is studied, making it impossible to determine whether the results will hold for another cohort. To address this problem, Schaie (1965) suggested the cohort-sequential design, a longitudinal study involving several cohorts simultaneously. Table 1 illustrates the pattern of data collection in a cohort-sequential design. Children were measured yearly beginning in the seventh grade. Each year for 4 years a new cohort of seventh graders is added to the study. Any analyses examining change over time in cohort 1 can be replicated in the other three cohorts. Cohort-sequential designs similar to this have been used extensively in drug abuse prevention research (e.g., Graham et al. 1990; Hansen and Graham 1991).

Sampling. The sampling of families for substance use prevention research requires a clear operational definition of the family, especially given the potentially dynamic nature of family structure and membership. In fact, the rapidity with which family composition can change presents a challenge to those formulating a sampling plan for family-based prevention studies. One operational approach is to limit

TABLE 1. *Cohort-sequential design.*

Cohort Number	Year 1	Year 2	Year 3	Year 4	Year 5
Cohort 1	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11
Cohort 2		Grade 7	Grade 8	Grade 9	Grade 10
Cohort 3			Grade 7	Grade 8	Grade 9
Cohort 4				Grade 7	Grade 8

the sample to those families meeting certain characteristics (e.g., restrict the sample to intact families in which the parents have been married at least 5 years). This will not eliminate the problem, but it has certain advantages. First, by requiring that the parents be married at least 5 years, the researcher is ensuring that the marriage has endured past a period of high risk for divorce. Second, this plan ensures a baseline observation where all families are roughly comparable. Third, a more homogeneous sample tends to reduce unexplained variance (Hansen and Collins 1994), potentially increasing statistical power.

However, this approach also has some significant disadvantages. The likelihood of divorce, remarriage, and remixing of families is reduced but by no means eliminated by this strategy. Furthermore, the study's generalizability is severely reduced, because the conclusions describe only intact families. In family-based research, as in most other areas in the social sciences, the researcher is often confronted with a painful tradeoff. Limiting sampling eligibility reduces unexplained variance, potentially increasing statistical power and internal validity. However, limitations of sampling eligibility reduce external validity (Hansen and Collins 1994). This is a difficult decision, with the choice highly dependent on the precise circumstances of a project. The authors' bias favors maximizing internal validity, because a study with sufficient internal validity at least provides a basis on which to plan further research involving a more heterogeneous sample. In contrast, a study with poor internal validity does not allow for conclusions about any population.

Missing Data and Subject Attrition. Both cross-sectional and longitudinal research are subject to problems caused by missing data.

Data can be missing because study participants fail to complete one or more items on a questionnaire or because participants were unavailable for one or more waves of data in a longitudinal study. In fact, one of the most serious difficulties of longitudinal research is the virtual impossibility of conducting a study over a period of years without some subject dropout, often referred to as attrition. If attrition is truly random (i.e., every subject in the study has an equal probability of dropping out), then the only problem is the loss of statistical power associated with a reduced sample size.

Although in most studies a proportion of subject dropout can be considered random, a substantial amount of subject dropout is commonly nonrandom. Nonrandom attrition can affect both the internal and external validity of a study. Attrition affects internal validity if it occurs differentially between treatment and control groups. A classic example of differential attrition occurs when an intervention is administered, such as a family-based drug abuse prevention program. The most dysfunctional families may drop out of the program, or at least make themselves unavailable for data collection. This leaves a higher proportion of well-functioning families in the treatment condition, which can make the treatment condition look more effective. External validity may also be affected. For example, lower socioeconomic status (SES) families tend to be more transient and therefore to move out of the school district and the study. The loss of these families means that the generalizability of the study to lower SES groups is limited.

Attrition is more complicated when families are the focus of study. An entire family can drop out of a study, or one or more members of a family can drop out. Divorce can mean that over the course of a longitudinal study some family members are no longer available. A complicated situation also arises when a family member is "replaced," as when a remarriage places a stepparent in the home. The researcher then must decide how to treat this newly configured data—treat the father's data as missing after the divorce and add the stepfather's data, treat the stepfather's data as father's data, or attempt to collect data on the father and stepfather. These issues must be thought through, keeping in mind the questions a particular study is designed to address.

It is important to minimize the amount of missing data due to nonresponse, subjects not making themselves available for a particular data collection session, or subjects leaving a study entirely. In family-based research, as in all research, subjects should be given enough time

to complete any measurement instruments or interviews and should be strongly encouraged not to skip items. Family research may require more time for this than school-based research when there is variability in the ages and reading skills of people completing the instruments.

It is also important to set aside resources for the purpose of minimizing the amount of missing data. In family-based research, more resources are needed for this purpose than for school-based research. Families do not appear for data collection in large groups at previously scheduled times, the way children in school are available for data collection in class. Instead, repeated attempts must be made to schedule data collection sessions with families, at times and in locations that are convenient for them. In many cases not all family members will be home for a data collection visit, making more than one visit necessary.

In longitudinal family-based studies, resources should be devoted to finding and collecting data from those who drop out of a study. Good planning can make this more efficient; for example, on the first data collection occasion, information can be obtained to make it easier to track people if they move, such as place of employment, driver's license number, or the address and phone number of a close friend or relative. This strategy has become especially valuable with recent advances in corrections for missing data (Little and Rubin 1987; Schafer, in press). These advances provide a way to make use of all the data that are present and to eliminate much of the bias associated with nonrandom attrition. Using missing data procedures, the researcher can approximate the data had there been no subject dropout.

The conventional wisdom has been that researchers attempt to find every subject who has dropped out of a study, with a goal of achieving a completely restored dataset. In practice, some of these subjects will be relatively easy to find, others less so. Because every study has finite resources, usually the effort to contact dropouts must end before every dropout has been found. In fact, the result of this approach is usually a sample of dropouts who are relatively easy to find, while the type of subject who is difficult to find is underrepresented.

However, statistical procedures can most effectively estimate what the results would have been like with complete data if data from a random sample of dropouts were available (Graham et al. 1994). In other words, if missing data procedures are to be used, the goal of contacting dropout subjects should be to obtain a random sample of subjects who have left

the study rather than to obtain a complete data set, given that obtaining a complete data set is unrealistic. This suggests a strategy where a random sample of dropouts is pursued vigorously until complete, even if this random sample is considerably smaller than what would have been obtained if attempts were made to contact all dropouts. Even when an exactly representative sample of dropouts is only approximated, this strategy is still preferable (Graham et al. 1994).

Number, Timing, and Temporal Spacing of Observations in a Longitudinal Study. In longitudinal research it is common to collect data in "waves" (i.e., to collect data at approximately the same points in time for all subjects). In family-based research, data might be collected on all subjects once each semester of the school year and once in the summer. When this data collection strategy is used, the study is often referred to as a "panel study." In other data collection strategies, data may be collected at different times for different individuals.

When designing a longitudinal study, it is important to pay careful attention to the number, timing, and temporal spacing of data collection. Every longitudinal study, except those in which only the simplest linear model is hypothesized, should involve more than two waves of data. A common problem in otherwise well-designed longitudinal studies is that too few data collection sessions, spaced too far apart, are planned. Then it becomes difficult or impossible to model growth accurately, because too much of the growth has occurred between observations. Consider the growth depicted in figure 1. Few would describe this growth as linear, yet it appears linear if measures are taken only at times 1, 7, and 13.

Careful planning is needed if data collection points are to optimize the view of individual growth; this planning should balance conceptual and methodological considerations, findings from previous research indicating plausible patterns of growth, and practical issues such as funding. During periods of rapid change, measurement should occur more frequently. A more slowly moving or strictly linear process can be measured with fewer observations spaced farther apart.

In most cases, researchers can formulate reasonable hypotheses about the pace and direction of change. For example, some periods of the lifecourse are characterized by a higher risk for the onset of particular substance use. Also, many individuals run a higher risk for substance use during

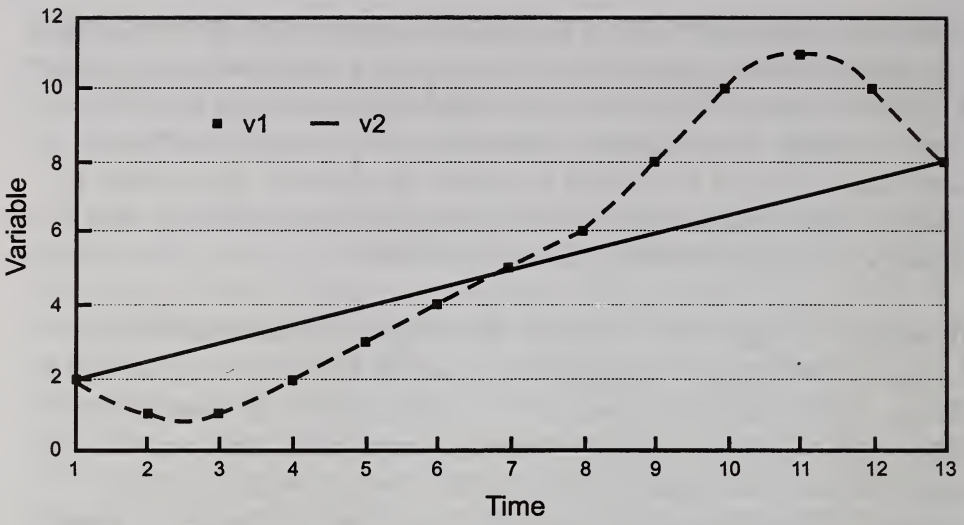

FIGURE 1. *The broken line represents change in a dynamic variable. The solid line represents how this growth would appear if measured only at times 1, 7, and 13.*

periods of change. Simmons and Blyth (1987) showed that adolescents experiencing multiple transitions simultaneously are at a higher risk for depressed mood. Thus, knowledge about the age distributions that describe such transitions as pubertal change, the transition to junior high school, and dating patterns may all serve to inform the "when and how many" of data collection.

Statistical considerations are also relevant to the timing and spacing of observations. Statistical procedures for modeling growth and change make different requirements about the spacing of observations in a longitudinal study. Some methods, such as repeated measures analysis of variance with polynomial contrasts, require that observations be evenly spaced and conducted at the same time for all individuals. Others, such as latent growth-curve modeling (Willett and Sayer 1994) and latent transition analysis (Collins and Wugalter 1992), require that observations take place at the same time for all individuals, but not that they be evenly spaced. Approaches based on hierarchical linear models (Bryk and Raudenbush 1992) allow variation in both spacing and timing of observations.

Finally, data collection is expensive, and a shortage of resources may limit how frequently measurement can take place. Sometimes a compromise can be reached where more indepth data collection is alternated with shorter, less expensive data collection sessions.

However, if data are collected too frequently, test-retest bias or other measurement effects can result. A balance must be struck between measurement frequent enough to allow close observation of dynamic phenomena and infrequent enough to avoid measurement artifacts.

The Experiential Sampling Method (ESM) represents an alternative approach to the temporal spacing of observations (Csikszentmihalyi and Larson 1992; Larson and Csikszentmihalyi 1983). Typically, individuals provide systematic self-reports at random occasions during the waking hours of a normal week. Participants carry signal devices and respond to randomly programed pages. These self-reports may include responses to standard scales of affect, control, self-perceptions, and physical well-being, as well as brief, open-ended descriptions of the activity. This method emphasizes ecological validity and the interactions of context and intrapsychic processes in the flow of activity (Hormuth 1986). Data files created from sets of these reports then constitute a description of a sample of random daily experiences.

For example, Larson and his colleagues (1992) use the ESM to study the personal and situational correlates of alcohol and marijuana use. The sample of 75 Caucasian adolescents is based on a stratified procedure at a large suburban high school and includes a range of students in terms of gender, grade level, and social class. Students carried electronic pagers and were signaled at random within every 2-hour time period between 7:30 a.m. and 10:30 p.m. on weekdays and until 1:30 a.m. on Friday and Saturday nights. Participants filled out a self-report form with each signal; the response rate was 69 percent for 4,489 time samples. Nineteen adolescents reported 25 occasions of alcohol use and 19 occasions of marijuana use.

An analysis of the objective circumstances of usage reveals that alcohol is consumed on Friday and Saturday evenings with groups of four or more, while marijuana use occurs at all times during the week, usually with just one other person. An analysis of subjective states during usage generally reveals heightened positive moods for alcohol (e.g., feelings of happiness, sociability, and freedom), while use of marijuana is not strongly associated with positive changes in mood, though it is associated with a stronger motivation for usage. Larson and colleagues also used the ESM data to study one heavy marijuana user's profile and reported that the individual used the drug to kill pain, cope with his family, and do homework, although usage was actually not related to positive changes in mood (see deVries 1992 for further applications and discussion of

ESM). Sampling strategies such as this could prove valuable in developing prevention programs that are attuned to the daily experiences of users.

Measurement Issues in Family-Based Prevention Research

Cross-Sectional Comparisons Across the Lifecourse. Family-based research involves people from the entire lifecourse. Anyone from a newborn to a 100-year-old great-grandparent might be involved. This makes for very rich data, but it also presents significant measurement challenges. Before comparisons can be made across individuals at different points in the lifecourse, it is first necessary to establish that the measures to be used are equivalent so that a basis exists for the comparison. When one instrument is suitable for the entire lifecourse, procedures for establishing factorial invariance (Cunningham 1991; Horn 1991) can be used to provide evidence that the same latent variable is being measured by the instrument when it is applied to different age groups. However, factorial invariance procedures cannot be used when a variable must be operationalized differently for different ages. For example, there is evidence that temperament is an important factor in the development of substance use habits throughout the lifecourse (Tarter et al. 1990). However, temperament is manifested in very different ways at different points in the lifecourse. Suppose a study assesses temperament in infants by the amount of time spent crying, in younger children by rating characteristics of observed social interactions, and in adolescents through self-reports. To measure stability over time, or to examine intergenerational differences, the researcher must find a way to equate these three very different measures of temperament. Currently there is no well-established methodology for doing this.

Longitudinal Measurement of Dynamic Variables. The dynamic variables that appear so regularly in family-based substance use prevention research present special methodological challenges. In fact, the traditional approaches to instrument development that work well for many research settings fall short when used to develop instruments to measure dynamic variables. This largely has to do with how intraindividual variability, as opposed to interindividual variability, is treated. The traditional definition of reliability, an operational definition of measurement precision, is usually stated as the proportion of observed score variance in an instrument that is attributable to true score variance (Lord and Novick 1968). It is assumed that both true score and observed score variance are interindividual variances (i.e., variances between individuals at a single time). But when individual change over time is of interest (the individual can be an individual family as

well), intraindividual variance, the variance in an individual's responses over time, becomes important.

Because the traditional definition of reliability does not involve intraindividual variance, it is not a definition of measurement precision for measures of dynamic latent variables. Furthermore, irrespective of the amount of intraindividual variability, if there is little or no interindividual variability, a measure is unreliable by the traditional definition. (This is one reason why it can be difficult to achieve high reliability for measures of substance use based on a sample of young children who are early in the onset process; under these conditions there is very little interindividual true score variability in substance use.) This means that procedures such as computing Chronbach's alpha do not help to determine the quality of a measure for a dynamic latent variable (Collins and Cliff 1990).

Several alternatives to traditional approaches have been suggested for developing measures of dynamic variables. Willett (1989) showed that traditional reliability theory can be extended to dynamic variables by incorporating a growth-curve model. However, this extended definition still relies on the presence of interindividual variability. Collins and Cliff (1990) and Collins and colleagues (1988) extended the Guttman scale to longitudinal data. This approach had the advantage of not relying on the presence of interindividual differences, but was suitable only for dichotomous data fitting a fairly strict Guttman model. Embretson (1991) extended latent trait models for use with longitudinal data. However, these models too are primarily for dichotomous data from ability or cognitive tests, rather than for the psychosocial variables likely to be of interest in family-based research.

Statistical Analysis in Dynamic Family-Based Prevention Research

Many of the research questions in family-based prevention are phrased in terms of intraindividual growth and change over time. For example, What is the hazard profile that describes the probability of substance use across the teen years? Is this profile different depending on whether adult family members are heavy substance users? Can an intervention alter its course, and if so, in what way? Does an intervention alter the probability of onset in an individual, or does it change the point at which probability of onset levels off? Until recently, it was difficult to answer these kinds of questions because statistical procedures for handling

short-term longitudinal data did not exist. Today there are numerous statistical procedures that can address these kinds of questions, including latent growth-curve modeling, survival analysis, and latent transition analysis.

Growth-Curve Modeling. Latent growth-curve models depict repeated measures as intraindividual growth parameters and their interindividual differences (McArdle 1986; McArdle and Epstein 1987; Willett and Sayer 1994). As opposed to multiwave autoregressive models, which estimate interindividual change between measurement occasions, latent growth-curve models estimate the full trajectory of change across an individual's measurement points. The growth-curve parameters estimated in a latent growth-curve framework allow for the testing of numerous developmentally sensitive hypotheses.

First, a simple model provides estimates of the average growth curve (intercept and slope) across individuals and the variances of these population parameters, which indicate the amount of interindividual variation in the growth parameters. For example, one could estimate a growth curve that describes the average number of cigarettes smoked per week in the past month over three measurement occasions. The intercept would indicate the average number of cigarettes smoked at a reference timepoint (e.g., the first occasion), while the slope would tell the direction and rate of change in the number of cigarettes smoked over the time period studied. A particularly interesting application of these trajectories involves testing whether prevention interventions affect developmental change: Growth curves can be estimated separately for two groups, one with a prevention intervention and a control group. The models' growth parameters can then be compared to ascertain whether the intervention had an impact on the level or rate of change in the criterion.

A second model provides estimates of how various factors predict differences between individual growth-curve parameters. Suppose there is significant variation in the slope parameter, indicating that individuals differ in the direction and/or rate of change in cigarette smoking. What factors explain why some individuals increase the number of cigarettes they smoke more rapidly than others? This question can begin to be answered by adding predictors of interindividual variability in the slope. For example, this approach was used by Bolger and colleagues (1995) to study the relationship between poverty and the developmental trajectories of children. A developmental trajectory of peer popularity

was estimated, and family predictors were added to this model. The authors reported that children from families experiencing economic hardship had significantly lower levels of popularity among peers (i.e., hardship accounts for variation in the intercept of the popularity trajectory), although they enjoy an accelerated increase in popularity (i.e., hardship accounts for variation in the slope of the popularity trajectory) when compared with children from families without economic hardship.

Finally, latent growth models allow researchers to test hypotheses about interlocking trajectories between variables (i.e., whether variation in levels or rates of change in two variables are correlated) with associative or cross-domain models (Tisak and Meredith 1990; Willett and Sayer 1995). This class of hypotheses relates a growth parameter for one variable (e.g., rate of change in beer consumption) with a growth parameter in other variables (e.g., rate of change in parental monitoring) and so tests relationships between two developmental functions. For example, McLeod and Shanahan (in press) estimate growth trajectories of the family's cumulative years in poverty and the antisocial behavior of their children. They report that the slope describing cumulative years in poverty correlates significantly with the slope of children's antisocial behavior. Thus, rate of change in family experience is correlated with rate of change in children's psychosocial adjustment.

Survival Analysis. A slightly different type of question involves asking how long it takes for an event to occur: How long before a first experience with drunkenness? How much time between first trying a cigarette and onset of regular smoking? Does an intervention delay the first experience with marijuana? These kinds of questions can be addressed using survival analysis, which models time to an event (Singer and Willett 1994). Survival analysis is not a new approach, but it is relatively new to the field of prevention.

In their very helpful introduction to survival analysis, Singer and Willett (1994) illustrated the use of survival analysis to model relapse in ex-smokers. They used data collected monthly for 12 months beginning from when the smokers first quit. The survivor function describes the cumulative probability of not relapsing as a function of time. In other words, the survivor function represents the probability that a randomly selected individual has not relapsed by some particular time. The hazard function, which is a close relative of the survivor function, can be used to express the probability of relapse as a function of time. This differs from

the survivor function in that it is not cumulative. Thus, it represents risk as a function of time. By examining the hazard function it is possible to identify points of time where risk is particularly high or low. Singer and Willett (1994) used a hazard function to show that the risk of relapse is highest in the first 2 months after a smoker quits smoking, declines in the third month, and increases again in the fourth month. This hazard function reveals risk periods when smoking cessation programs might want to concentrate efforts on preventing relapse.

Survival analyses have the capability of including both static and dynamic predictors in a model. In the smoking cessation example, it would be possible to add a static predictor that would allow the comparison of survival and hazard functions across several different types of cessation programs. It would also be possible to add perceived stress, also measured monthly, as a dynamic predictor of the risk of relapsing.

Latent Transition Analysis. It is often useful to think of substance use onset and related variables as stage sequences. For example, the early part of the substance use onset process can be thought of as a series beginning with alcohol or tobacco, then experiencing drunkenness for the first time, then going on to higher levels of use. This point of view can offer unique insights on the onset process. For example, Graham and colleagues (1991) showed that adolescents who initiated the onset process with tobacco were on an accelerated onset trajectory compared with those who initiated the onset process with alcohol.

Latent transition analysis (LTA) is a methodology for estimating and testing latent variable models involving stage sequences over time (see Collins and Wugalter 1992; Collins et al. 1994; and Collins et al., in press). LTA is analogous to covariance structure modeling in many ways. Like covariance structure models, LTA models provide parameter estimates that express the strength of the relationship between the manifest and latent variables. In covariance structure models, these parameters are factor loadings. In LTA models, a different parameter serves the same conceptual purpose. While covariance structure modeling involves a continuous latent variable and (usually) continuous indicators, LTA involves a discrete, stage-sequential latent variable with discrete, often dichotomous, indicators.

One of the most interesting aspects of LTA models is the transition probability matrix. This matrix expresses the probability of transitioning

to a stage, conditional on earlier stage membership. For example, one element of the transition probability matrix would be the probability of transitioning to a stage involving drunkenness, given that the individual had tried alcohol in the immediately previous measurement occasion. An important advantage of the LTA approach is that the transition probability matrix is adjusted for measurement error, providing a clearer picture of stage transitions over time.

THE CONTEXT OF FAMILIES AND THE FAMILY AS CONTEXT: MULTILEVEL ISSUES

It has been recognized for some time that school-based research in substance use prevention is multilevel. For example, individuals are nested within classrooms, classrooms are nested within schools, schools are nested within school districts, etc. In multilevel data structures such as this, there are at least two sources of dependence among individuals. First, individuals within groups are not sampled independently. In most school-based prevention studies, classrooms or schools are sampled rather than individual subjects. Second, the treatment is delivered to groups rather than individuals, which means that group-level characteristics and dynamics have an effect on the outcome as well as individual-level characteristics of the subjects. These two factors can produce data that contain dependencies (i.e., an individual within a group tends to be more similar to other group members than to individuals outside the group). Most studies have found relatively little dependence among observations in the nested structures that occur in school-based studies (Graham et al. 1995; Murray et al. 1994). However, even small dependencies must be taken into account, as they can severely bias significance tests (Barcikowski 1981; Kreft 1994). A third source of dependence occurs within individuals when repeated measures are taken over time. In this case, the repeated measures can be considered nested within the individual.

In family-based substance use prevention research, the multilevel structure is more complicated, and dependence among observations is potentially greater. The family is both embedded within a larger context, consisting of school, neighborhood, community, and region, and also is itself a context for individual family members. Family members are likely to be much more similar than students within classrooms, and so the effect of this part of the hierarchical structure may have profound effects on research results. Furthermore, effects can take place at various levels in the hierarchy. The important concepts of risk and

protective factors for substance use provide many examples of this. Attitudes toward risk taking and rebellious tendencies are examples of individual-level risk factors for adolescent substance use. Family norms about substance use is a family-level risk factor, while familial warmth and closeness are family-level protective factors. Religiosity may be both an individual-level and a family-level protective factor. Parental monitoring may be both a family-level variable and a neighborhood-level variable, because effective monitoring must occur both inside and outside the home.

Measurement Issues in Multilevel Family-Based Prevention Research

The multilevel nature of family-based research presents some interesting challenges to measurement. In family research, a latent variable may have meaning at several different levels. For example, each individual in the family has a point of view on how warm the family is. In addition, the family as a group can be rated on how warm it is. When a latent variable can be conceptualized at more than one level, there are several approaches to measurement. One is to treat the individual family member reports as indicators of the latent variable family warmth, using them to triangulate on the family-level construct. This assumes that the reports of the individual family members are all measuring the same latent variable and treats variance unaccounted for by this latent variable as error (e.g., Lorenz and Melby 1994). Alternatively, one can treat family warmth like a group of separate latent variables. There is a latent variable corresponding to each family member's point of view on warmth and another corresponding to family-level warmth. This approach assumes that the perceptions of individual family members about family warmth are worth measuring in and of themselves and that there may be valid variance in these individual reports that is not shared by the family-level latent variable.

Analytic Strategies for Multilevel Data

Multilevel phenomena can be modeled realistically by means of hierarchical linear models (Bryk and Raudenbush 1992; Goldstein 1989). Hierarchical linear models allow for the dependence among observations that results from nested data structures, and so are especially valuable for studies involving the family. Repeated measures of a criterion variable (e.g., average number of beers drunk per week in the previous month) might constitute one "level" of analysis (the within-persons or intraindividual

level). A second level, the between-persons level, might consist of attributes of the person that can change (time-variant covariates such as family structure) or remain constant (time-invariant covariates such as gender). A third level of analysis could be a school-level variable such as the presence of an alcohol prevention program.

Nested data structures such as these have important implications for statistical analysis. In any hierarchical data there is likely to be dependence among observations. In other words, individuals who are sampled in a cluster will tend to be more alike in their responses than individuals who are sampled independently. Unlike the relatively low levels of dependence found in school-based research, the dependence among family members is likely to be comparatively higher. This dependence among observations is known to inflate the Type I error rate (probability of rejecting the null hypothesis when it is true) if it is not modeled in statistical analyses (Barcikowski 1981). The amount of inflation in Type I error rate is a function of the degree of dependence and the size of the clusters. In a situation where the clusters are fairly large, such as classrooms or schools, even a small amount of dependence can appreciably increase the Type I error rate.

By means of hierarchical linear models, dependence among observations can be accounted for, and growth curves for repeated measures variables can be estimated. Furthermore, interactions among variables at different levels, including interactions between growth curves and between-person and school-level variables, can be examined. For example, a researcher can test the multilevel, dynamic hypothesis that students from intact families and in schools with an alcohol prevention program have the slowest rate of increase in beer consumption. This hypothesis implies three levels of analysis: (1) at the school level, the presence or absence of a prevention program; (2) at the between-persons level, family structure; and (3) at the within-persons level, the repeated measures used to estimate the slope describing change in beer consumption over the period studied.

Several different levels of analysis are potentially relevant in family prevention research. Community-level or neighborhood-level characteristics may be important to family-based prevention efforts (Wagenaar and Perry 1994). Thus, one level of analysis taps the context of the family. A second level of analysis is present when data include information from multiple family members. Unfortunately, within-family dependence has rarely been recognized, but a notable exception is

found in Barnett and colleagues' studies of distress in dual-earner couples (Barnett et al. 1993, 1995). Other levels might include between-person variables such as gender or repeated measures (for an application, see Shanahan et al., in press).

DISCUSSION

This brief overview of methodological considerations in family prevention research points to a number of generalizations for the intervention researcher. First, the complexities of prevention research require that conceptual models be specified early in the research process, ideally before the study itself has been designed (Collins 1994). Developmental research in family prevention is complicated by the dynamic and multilevel nature of families. This complexity requires rigorous theory: What is it about families that matters for substance use and why? Only specific hypotheses can point to the most appropriate methodology. At the same time, many methods require data with a specific structure (i.e., number of subjects or respondents, number and timing of observations). Thus, a conceptually based hypothesis will often dictate both the method and the type of data that are required.

Second, every research team should include a methodologist who actively participates from the very beginning of the study. This review has not covered a number of potentially relevant methods (e.g., trait-state-error models, Kenny and Zautra 1995) and has glossed over many distinctions and nuances (e.g., the differences between growth curves estimated in latent growth curve versus hierarchical linear modeling frameworks). In fact, recent advances that may be useful to prevention researchers are numerous (e.g., hierarchical latent growth-curve models, Muthén 1994) and dynamic, multilevel modeling defines a major area of methodological research.

Third, even this brief survey suggests highly useful avenues for methodological research. Because the timing and spacing of observations in a longitudinal study are so important, information that helps with this decision is very valuable. Hazard profiles for substance use prevention, such as onset across the early teen years, would be a great help to researchers designing longitudinal studies. These profiles would make it possible for researchers to time measurement and interventions for high-risk periods. Measurement is also an important area where much work is needed. More and better methodology is

needed to help the prevention researcher develop sensitive and precise instruments for dynamic latent variables. Currently, hierarchical data structures are ignored by most measurement procedures. Methodology is needed for situations where there is a nested data structure, and in particular for developing instruments for latent variables that involve multiple levels. More research on establishing equivalence of measures across the lifecourse is needed also. Finally, hierarchical data structures are an issue for nonlinear models, such as survival models and latent class models. Currently these models do not incorporate nested structures; research is needed on how to generalize them in this way. Some promising research on hierarchical survival models is currently underway by Murphy (1994, 1995).

Despite the highly variable nature of contemporary family life, there is considerable evidence that the family can promote manifold dimensions of well-being, including health-related behaviors (Waite 1995). What kinds of households promote the healthy development of its members? What are the processes by which the context of the family and the family as a context matter for the well-being of children? These questions have important implications for prevention policy. The answers to them will require clearly specified developmental models and the careful application of dynamic and multilevel methods.

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AUTHORS

Linda M. Collins, Ph.D.
Professor and Director

Michael J. Shanahan, Ph.D.
Assistant Professor

The Methodology Center
Department of Human Development and Family Studies
Pennsylvania State University
S-159 Henderson Building
University Park, PA 16802

Methods for Investigating Costs and Benefits of Prevention Interventions

Pinka Chatterji, Lisa Werthamer, Marsha Lillie-Blanton, and Christine Caffray

IMPORTANCE OF INVESTIGATING COSTS AND BENEFITS OF DRUG ABUSE PREVENTION

Adolescent drug use is a major public health problem because of the proportion of the population using drugs and because of the multiple effects of adolescent drug use on adolescents, their families, and their communities. In 1993 an estimated 87 percent of high school seniors reported use of alcohol, 35 percent had used marijuana, and 6 percent had used cocaine sometime in their lifetime (Johnston et al. 1994). High school senior data are considered lower bound prevalence data because the sample does not include an estimated 20 percent who dropped out of school, a subset with higher rates of drug use than the students surveyed (Johnston et al. 1994). Particularly disturbing is the proportion of drug users with preadolescent onset of use, with 24 percent of students reporting that they used alcohol by sixth grade (Gleaton and Adams 1990).

Drug use is linked to increases in the adolescent's health-related risk behaviors such as failure to use condoms, failure to use birth control, and sharing of intravenous needles (Cahalan 1991) and also increases in risk for a number of health conditions, including cancer, chronic liver disease, heart attack, stroke, and HIV/AIDS (Colliver and Malin 1986; U.S. Department of Health and Human Services (1991). Drug use has psychological and economic impacts on the adolescent's parents and siblings (Brook et al. 1990) and increases the risk of infant mortality and morbidity for the offspring of childbearing adolescents (Chasnoff 1988; Kleinman et al. 1988; Little et al. 1989). Community impacts stem from the association of drug use with motor vehicle accidents, suicide, homicide, rape, assault, and robbery (Inciardi and Pottieger 1991; Perrine et al. 1988). Current analyses estimate that the U.S. economy absorbed $70.3 billion in alcohol abuse costs and $44.1 billion in other drug abuse costs (Rice et al. 1990). A 1987 report sponsored by the Boy

Scouts of America, "Making the Grade: A Report on American Youth," estimated that drug use is a major determinant of school dropout for two-thirds of all dropouts, resulting in losses of $228 billion in personal income and losses of $68 billion in taxes.

To reduce the misuse of licit and illicit drugs, the U.S. Department of Health and Human Services (DHHS) has increased funding for drug abuse prevention demonstration projects. Over the past three decades, a wide range of prevention strategies has been implemented, directed at modifying characteristics of adolescents (e.g., increasing drug knowledge, changing attitudes about drugs, increasing social skills and resistance to social influence or peer pressure) and modifying the environmental context of adolescents (e.g., providing alternative opportunities for challenge, increasing parental influence on school policy, and increasing community influence).

With evidence that adolescent drug use has been rising in recent years, questions about the value of prevention programs are once again prominent in the public debate. Moreover, questions about program effectiveness are being increasingly linked with questions about program costs. Unfortunately, the literature on the cost-effectiveness and costs and benefits of prevention programs is relatively new and limited in scope.

In a review of the health literature from 1979 to 1990, Elixhauser and colleagues (1993) cited 3,206 studies that used either cost-benefit analysis (CBA) or cost-effectiveness analysis (CEA) to evaluate mostly clinical procedures. The authors classified 88 of the 3,206 articles as studies that focus on topics related to prevention. None of these 88 articles deals specifically with an evaluation of a drug abuse prevention program. Since 1990 more articles have been published that involve CBA and CEA of prevention programs; however, still no published studies exist that apply CEA or CBA to a drug abuse prevention program.

This chapter seeks to contribute to researchers' knowledge about the costs and benefits of drug abuse prevention by describing common methods of economic analysis, identifying critical challenges in measuring the costs and benefits of drug abuse prevention, and outlining a list of important steps to follow in an economic evaluation. Emphasis is placed on the practical application of these methods to a drug abuse prevention program called ALPHA. The ALPHA program is operated

by Operation PAR, in cooperation with the Pinellas County School Board in the State of Florida. The chapter concludes with recommendations on a process for progressive refinement and dissemination of economic evaluation methods for the drug abuse prevention research and service communities.

COMMON ECONOMIC ANALYSIS METHODS: DEFINITION OF TERMS

Policymakers in governmental bodies, schools, community-based organizations, and funding agencies increasingly are being asked to justify expenditures on complementary, but competing, programmatic efforts. They also are being asked to choose between programs that seek to achieve similar goals. While issues of costs generally are important to policymakers, they are particularly important in an era of fiscal constraints and declining resources.

Drummond and colleagues (1987) define economic evaluation as "the comparative analysis of alternative courses of action in terms of both their costs and consequences." The heart of this process is the concept of opportunity cost, in which the true cost of a drug abuse prevention intervention is essentially the foregone benefits that could have been achieved had the resources been used for the next best alternative (Drummond et al. 1987). For example, the cost of a drug abuse prevention program that prevents a thousand children from using drugs may be a year of life of an elderly person, whose life could have been prolonged if the resources had been allocated toward an experimental therapy. When policymakers allocate funds for a particular program, they essentially are deciding that society will give up the benefits of some other program. Economic evaluation can help decisionmakers make these choices, while also attempting to ensure that limited funds are used efficiently.

This notion of an opportunity cost is particularly important when a health program is the focus of the analysis. Unlike other parts of the economy, many goods produced in the health sector are not explicitly bought and sold in markets. Normally, a market price reflects how much a society is willing to pay for a certain good or service. For example, according to economic theory, teachers' salaries indicate how much society values the education of its children. However, the amount society is willing to pay to prevent one child from using drugs is yet to be defined. It is difficult

to answer this question because prevention cannot be bought and sold in a market. This problem makes it particularly important that the opportunity costs of health interventions be made explicit—otherwise, the lack of prices to guide decisionmakers impedes efficient resource allocation.

The most common economic methods used to evaluate programs are cost-effectiveness analysis and cost-benefit analysis. (Cost-utility analysis is another method of economic analysis, but it is not discussed in this chapter.) Both of these two methods are used to compare the costs and the outcomes of alternative, competing programs. CBA and CEA are similar in the methods used to collect data on costs. Both require documentation of the total value of resources consumed by the program under evaluation, as well as other alternative programs being investigated. The methods, however, diverge in their treatment of the consequences, or the benefits, of the program and its alternative(s).

CEA is implemented under the assumption that the program under evaluation and its alternative both produce the same type of outcomes. The value of these outcomes themselves is not questioned—instead, the evaluator is interested in the least expensive means of producing these outcomes. That is, CEA is used to compare alternative policy or program interventions in an effort to assess which alternative achieves the desired goal at the lowest overall cost. For example, CEA may compare two drug abuse prevention programs (a parent training program versus a family training program), or the analysis could compare a defined drug abuse prevention program, such as a school-based social skills intervention, with the school's "usual efforts" with high-risk youth. An example of usual efforts might be an after-school recreational program for high-risk youth.

In CEA, the question of interest is, Which of the available alternatives is the least expensive way to produce a unit of drug use prevention? Units of prevention can be measured in a variety of ways (e.g., life-years gained, hospital emergency room visits prevented, cases of adolescent drug use prevented), but they must be measured the same way across alternatives. Usually, alternatives are compared using cost-per-unit effectiveness (i.e., unit of prevention) ratios.

CBA theoretically can be used to assess whether a program or policy intervention is a worthwhile investment in and of itself, without comparison to other programs. It also can be used to compare

interventions and policies. Traditionally, benefits as well as costs are valued in monetary terms—this feature distinguishes CBA from CEA, in which benefits are measured in their natural units. CBA is used to determine whether the benefits of a program measured in dollars outweigh its costs and thus justify the allocation of resources to that program. The most common indices in CBA are the cost-benefit ratio and net benefits.

The choice of approach in the valuation of costs and benefits in CBA reflects the assumptions and values of the researcher. The willingness-to-pay approach attempts to capture what individuals would be willing to pay for costs and benefits. For example, if an intervention reduces the probability of death or illness, willingness-to-pay methods would attempt to find what people would be willing to pay for a reduction in the probability of illness or death.

Willingness to pay for health outcomes is difficult to measure accurately for a number of reasons. For example, individuals' willingness to pay for a health improvement is heavily affected by income level (i.e., upper income families are able to pay more than poor families), and individuals are not accustomed to placing an explicit value on probability of illness or death. There is a growing literature on willingness-to-pay methods in the environmental economics literature. This growth is partly driven by the need to justify environmental regulations, which often impose hidden costs on businesses and, in turn, on consumers.

The human capital approach appears more appropriate for an assessment of the costs and benefits of drug abuse prevention because of current limitations in accurately measuring the willingness to pay for health outcomes. Under this approach, an individual's worth is measured by the discounted value of the individual's stream of productivity over time as measured by wages. The human capital approach assumes a societal perspective and, importantly, uses data that are more readily available and reliable. The human capital approach is appropriate for determining the economic cost of a disease or condition for a defined time period or for determining the cost savings of a specific procedure or intervention.

This approach, however, is limited when evaluating programs involving children or socially or economically disadvantaged individuals, because society tends to value its members for reasons unrelated to their productive capacity. The human capital approach can undervalue lifetime earnings if current wages do not reflect future value or true

abilities. Also, because of its dependence on market earnings, the human capital approach tends to undervalue certain other factors, such as pain and suffering (Rice et al. 1990).

Under the human capital approach, researchers may choose to estimate incidence or prevalence of an outcome. Prevalence estimates are used as the basis for evaluating the direct and indirect costs of an illness incurred during a defined time period such as a year. Incidence estimates are used to assess the lifetime costs of an illness (Rice et al. 1990). It is important to understand these assumptions that underlie the human capital method if the method will be used to value benefits in a cost-benefit evaluation.

Whether a researcher chooses to conduct a CEA or a CBA, there are a number of methodologic issues to be considered, such as whether the costs and benefits are direct or indirect, whether the costs and benefits are tangible, and whether the benefits can be expressed in monetary terms. The following discussion focuses on the definitions of these terms, which are commonly used in economic evaluation studies. Examples of these issues are highlighted in a later section.

Using the Rice and colleagues (1990) methodology, it is useful to classify the benefits of drug abuse prevention as "direct," "indirect," and "other related benefits." In their work on the cost of drug abuse and mental illness, Rice and associates (1990) use this classification system for costs. Since the costs of drug abuse are avoided when abuse is prevented, these costs are actually the benefits of a drug abuse prevention program.

Direct and indirect benefits are classified under the more general category of core benefits. Core benefits are typically those that result directly from preventing the illness or condition itself. Core benefits include direct costs avoided such as dollar expenditures on health, mental health, and social services related to drug misuse and indirect costs avoided, which include the value of lost or reduced productivity. For example, if a patient participates in an inpatient drug abuse treatment program, the hospital expenses incurred are direct costs, while the wages lost by the patient are indirect costs. If this case of drug abuse had been prevented, the foregone hospital expenses and lost wages could be classified respectively as the "direct and indirect benefits of drug abuse prevention."

Other related costs are secondary to the condition under study, pertaining instead to the nonhealth effects of the illness. Like core benefits, other related benefits include direct costs avoided, for which monetary payments are actually made, and indirect costs avoided, which represent lost resources. Other related benefits include direct benefits, such as dollar expenditures avoided on drug abuse-related services (e.g., the avoidance of costs associated with the social welfare system), and indirect benefits, such as the value of delinquency or criminal activity avoided (e.g., avoidance of lost productivity due to incarceration) (Rice et al. 1990).

An important issue that arises in most economic evaluations is that some costs and benefits may be difficult to value in monetary terms, and other costs and benefits may be difficult to describe. For example, a treatment intervention may cause physical pain or anxiety. These factors are intangible costs of the intervention, and they may be difficult to describe and impossible to value accurately in dollars. This problem also arises in the context of benefits. For example, a school-based intervention may help children earn higher grades. This benefit may be easy to describe, but it is still difficult to value in dollars.

Researchers have attempted to quantify intangible costs and benefits using a variety of innovative methods. The "cost" of physical pain, for example, can be estimated by a patient's expenditure on pain medication (Drummond et al. 1987). Questionnaires and experiments based on the willingness-to-pay approach can be used to elicit values for intangible costs and benefits. For example, a researcher might try to determine consumers' willingness to pay for a reduction in pain by using a highly structured survey that elicits dollar values from individuals. Drummond and colleagues (1987) point out that it is important to assess whether using these relatively new methods to value intangible factors truly will aid decisionmaking. If not, it may be better to avoid this often difficult and expensive process.

CRITICAL CHALLENGES IN MEASURING THE COSTS AND BENEFITS OF PREVENTION

The application of CBA, CEA, and the other economic evaluation concepts described earlier presents the researcher with many challenges. These challenges have not yet been addressed in the context of a drug abuse prevention program, in part because the economic evaluation of

these programs is still very new. Some issues, such as a lack of program-specific data, are not inherent in the methods outlined in the previous sections. Other problems, however, do result from methodologic limitations. Several critical challenges that arise in the application of economic evaluation techniques to drug abuse prevention programs are discussed in this section.

First, documenting prevention intervention program costs may not be as simple as expected. Since accounting records generally are not kept for billing purposes, and they tend to be of poorer quality than treatment records. Also, since many prevention programs are relatively new, they lack experience in cost accounting or they may not use an accounting system that sufficiently disaggregates costs as needed for cost-benefit analysis and cost-effectiveness analysis. This problem is magnified by the fact that a number of cost issues cross intervention and comparison conditions. When young people with multiple needs use multiple services, the problem of linking the service to one presenting problem versus another generally requires detailed information on the nature of the service use.

Requests for cost information, therefore, present an added burden for small programs with little or no institutional support or accounting infrastructure. Greater effort is generally required for documenting the costs of prevention services for youth in a comparison prevention program or who are engaged in efforts that could be considered the usual and customary efforts (i.e., the status quo).

Second, decisions must be made about handling one-time or shared administrative costs. For example, overhead costs and capital costs must be considered, especially when comparing established programs with new programs and their attendant capital costs. Volunteer contributions and other types of donations are also common in these types of programs. Donated goods and time represent a benefit to the program, but they can also be a hidden cost since volunteers often require training, facilities, office supplies, equipment (such as telephones and photocopiers), and other support in order to perform their jobs effectively.

Any assumption in the calculation and comparison must be made clear to decisionmakers in order to present a complete picture of the costs of a program. If the study is being conducted from a societal perspective, it is very important to include volunteer labor and donated goods and

services as program costs. Even though the program itself does not pay for these goods and services, they are essential to the functioning of the program and represent resources that could have been used elsewhere. That is, the analysis should account for the opportunity costs of these donated inputs.

Finally, the impact of an intervention may take years to realize, but the average study is limited to 4 years or less—this time period may not be sufficient to assess the impact of the program. Many of the long-term benefits of prevention interventions, for example, may occur in the use of health/mental health services or in the labor market. These outcomes can be measured and, in some cases, valued. But very few projects last long enough to follow youth into their young adult years when health/mental health and labor market outcomes can be measured.

In addition to measuring an effect, it is important to make an assumption about how long an effect will last. For example, if a prevention program is designed to raise self-esteem in children in an effort to prevent drug use, two important questions about the outcome are (1) How long will it take for self-esteem to be raised to a level that is defined as success? and (2) Will the effects of the increase in self-esteem last through childhood? Into adolescence? Into adulthood? These issues have implications for benefits valuation. In order to link short-term, intangible outcomes such as improved self-esteem to long-term, measurable outcomes such as adult wage, it may be necessary to make assumptions about the durability of prevention program effects.

These two critical challenges—cost documentation and limited observation of benefits—are important to address in an economic evaluation of a drug abuse prevention program. Some problems may be difficult or impossible to remedy. Even so, it is important that these issues are made explicit in the analysis and that the implications of any limitations are analyzed.

STRATEGIES FOR ACCURATELY ASSESSING THE COSTS AND BENEFITS OF A DRUG ABUSE PREVENTION PROGRAM: THE ALPHA PREVENTION PROJECT

Although many contend that drug abuse prevention programs are more cost-effective than treatment, there is little evidence of the financial costs and benefits of these programs. As discussed in the previous section, the

lack of research in this area reflects two critical challenges: difficulties in assigning costs to intervention and comparison conditions and problems in measuring outcomes that do not generally occur until many years after a program's completion. This section discusses strategies for resolving these two critical challenges in the context of the ALPHA Prevention Project, an ongoing NIDA-funded prevention research effort that includes an economic evaluation of a school-based drug prevention project for at-risk children.

The ALPHA Prevention Project is a NIDA-funded research effort to investigate whether an elementary school program for at-risk children has an impact on early adolescent drug use. The authors' research addresses this issue by linking together an existing drug abuse prevention program for at-risk children (the ALPHA program) with an existing annual survey (the Omnibus Survey). The ALPHA program is a school-based drug abuse prevention program targeting fourth and fifth graders with aggressive behavior, social withdrawal, learning problems, and low self-competence. The ALPHA program is operated by Operation PAR, in cooperation with the Pinellas County School Board. The semester-long "pullout" program intervenes with the targeted risk behaviors through behavior management strategies, social skills strategies, and curricular and instructional strategies.

The authors' sample is drawn from the Pinellas County School System Omnibus Project cohort. The Omnibus cohort is assessed annually using teachers and parents to report on a wide range of child and family characteristics from spring 1990 (when the children entered kindergarten) and continues through spring 2002 (when they will graduate from high school). The authors expect that collaboration with Omnibus will increase response rates because of the extra resources available to Omnibus for tracing the Omnibus cohort. Another advantage is access to prospectively gathered data from kindergarten through second grade, which enhances baseline information.

The authors' specific aims include investigating the impact of the ALPHA program on age of initiation of use, frequency of use, and problem use; developing and implementing a protocol to assess the costs and benefits of the ALPHA program and producing a technical assistance manual for drug prevention costs and benefits research; and investigating the effectiveness of screening procedures, identifying perceived barriers to program participation, and characterizing the process of transition out of the program; these last three issues are

critically important to the design of drug abuse prevention programs for at-risk children.

The authors' design is a field experiment with internal and external controls. At-risk children at four elementary schools feeding into the ALPHA program are randomly assigned to the ALPHA program or the internal comparison group, and at-risk children attending two similar schools constitute the external comparison group. The children in the internal comparison group at the four ALPHA feeder schools provide an important comparison for children enrolled in the ALPHA program because they are within the same school context. However, since children participating in the ALPHA program will return to classrooms and could potentially share information and skills learned in ALPHA with comparison children, a group of children in two other schools who are not likely to learn information and skills from returning ALPHA students is also needed.

All children were pretested at the end of third grade to obtain preintervention baseline data for checking the success of randomization, for modeling developmental trajectories, and for identifying subgroups that might respond differently to the intervention. Screenings were conducted at the end of third grade, beginning of fourth grade, end of fourth grade, and beginning of fifth grade to identify at-risk children. The screening consisted of an interview with the teacher, in which the teacher rated every child in the class, reviewed each child's recent grades, and conducted an interview with the child about self-esteem. Screening instruments were on op-scan forms so that scale scores could be rapidly obtained.

Children classified as being "at risk" (e.g., mild, moderate, or severe aggression; social withdrawal; learning problems; or perceived incompetence) at the ALPHA schools were randomly assigned to intervention (ALPHA) or control (internal control) conditions each semester during fourth and fifth grades. Assignments were made after consent was obtained to make the groups as comparable as possible. The intervention group, internal control group, and external control group will be assessed at the end of fifth grade, end of sixth grade, end of seventh grade, and end of eighth grade (spring 1995 through spring 1998). Four posttests allow examination of the pattern of drug use as the child makes the transition to middle school.

To ensure that thoughtful consideration is given to the methodologic issues involved in this analysis, the Costs and Benefits Workgroup includes a multidisciplinary team consisting of two economists, a biostatistician, an accountant, and a health services researcher. To assess the cost-effectiveness of the ALPHA program, ALPHA program costs for attaining a particular level of outcome were compared with costs and outcomes of the usual and customary school system practices for at-risk youth. Costs for the ALPHA program and usual and customary school practices were retrieved from financial statements and other relevant source documents using a cost questionnaire completed by school system and Operation PAR budget officials. Accountants from both Operation PAR and the school system assisted the authors in this effort.

Primary impact variables are measured through annual child interviews and include whether drug use has started, age at first use, and frequency of use for each of the main drugs used by elementary school children (alcohol, tobacco, inhalants, and possibly marijuana and cocaine). Empirical work suggests that the age of initiation of use is an important outcome in drug abuse prevention research. Children who use drugs at an early age are more likely to have frequent drug use and greater involvement in deviant activities such as crime and drug sales than children who use drugs at later ages (Robins and Przybeck 1985). In addition, a number of researchers have suggested the importance of distinguishing frequency of use from problem use (Newcomb and Bentler 1989; White and Labouvie 1989). Problem use augments data about frequency and quantity of drug use with contextual characteristics of the drug use. For example, Hughes and colleagues (1992) identified patterns of drinking in adolescence by assessing frequency, quantity, and context of use (where, when, with whom, and how alcohol was obtained). The pattern of problem drinking that emerged from this enriched data was characterized by binge drinking, problems with the law or accidents, problems with friends or relatives, and problems in school.

In addition, benefits are expected to accrue from reduced use of the following services: (1) educational services such as special education, retention, remedial services, and total years of schooling (K-12); (2) other services such as health and mental health; (3) educational achievement and employment measures such as number of years after high school and earnings; and (4) criminal behavior, such as victim costs and justice system costs. The authors are obtaining information about the benefits that are measurable during middle school (e.g., use of

educational services, use of health and mental health services, school truancy, and school crime) from annual child and family interviews and school record retrieval. It is important to note that researchers will need to assess the extent to which benefits such as use of health and nonhealth services and school truancy should be attributed to drug use rather than academic or behavior problems unrelated to drug use.

To assess whether the benefits of the ALPHA program outweigh the costs, the authors' project is comparing the monetary costs of the intervention efforts with their expected benefits expressed in monetary terms. Costs for the ALPHA program and usual and customary school practices are obtained from the cost questionnaire mentioned earlier. Benefits will be estimated using a cost-of-illness methodology, where the cost of drug use among youth serves as the measure of the benefits to be derived from preventing drug use. Monetary values will be estimated for outcomes measurable during the middle-school period (e.g., use of educational services, use of health and mental health services, school truancy, and school crime).

In addition, the long-term economic consequences of early drug use will be estimated using the National Longitudinal Survey of Youth, a nationally representative longitudinal survey of a group of young people who were 14 to 21 years old when first interviewed in 1979. Although mainly a labor market survey, the National Longitudinal Survey of Youth also contains information on alcohol and other drug use. From this data set, estimates can be made of the long-term effects of adolescent drug use that appear later in adolescence (i.e., high-school dropout) and in adulthood (i.e., low wages).

TEN IMPORTANT STEPS IN AN ECONOMIC EVALUATION WITH EXAMPLES FROM THE ALPHA ECONOMIC EVALUATION

From the discussion in the previous section, it is clear that many of the solutions to economic evaluation problems require a thorough understanding of the intervention, its alternative(s), and the environment(s) in which they exist. In fact, CBA and CEA methods may appear to be ad hoc in the sense that they are often modified to conform to the situation at hand (D. Salkever, personal communication, January 1996). Nevertheless, the methods should be viewed as flexible rather than arbitrary. The principles that underlie CBA and CEA follow

directly from economic theory and are not arbitrary. Even so, it is not possible or desirable to write a CBA/CEA "cookbook." Every evaluation will present the researcher with different challenges and constraints that may require a unique methodologic approach to that particular problem.

It is important, however, to understand the widely accepted principles of CBA and CEA. The following guidelines, modified from outlines of Banta and Luce (1983) and Drummond and colleagues (1987), highlight the most important features of the process using examples from the ALPHA evaluation. The objective of the guidelines is to present the general steps in a CBA/CEA as well as to focus on special issues that arise in an evaluation of a prevention intervention. The 10 steps outlined below are intended to help both researchers planning to undertake a CBA or CEA and those who are interested in interpreting the results.

1. Define the Problem

An assessment of the problem motivating the study is important because it shapes the analytic agenda of the investigation. The definition of the problem has implications for the study objectives and the methods of analysis. Even when the problem has been identified by the study's sponsor, restating the problem addressed by the intervention helps to ensure that the evaluator and the sponsor agree on the investigation's focus. If the problem lends itself to being quantified, it is useful to describe the problem, as well as its causes and consequences, in measurable terms.

In the ALPHA intervention, the problem addressed is adolescent substance use (defined as use of alcohol, tobacco, and other drugs). The problem statement cites evidence of the prevalence of adolescent substance use by specific types of drugs and trends in substance use in the last 5 years. Also included in the evaluation problem statement is knowledge about the health and societal consequences of adolescent substance use. For example, information is included on the risk of poorer school performance, involvement in juvenile crime, and the sale of drugs.

2. Formulate the Objective of the Study

Once the evaluator has explicitly stated the problem that has motivated the study, a specific objective must be formulated. This step will require

considerable thought because the evaluator must consider not only what needs to be learned but also the time, money, and other constraints facing the evaluation. It is also essential to recognize the inherent strengths and weaknesses of the methods individually and in comparison with one another.

It is useful to formulate the objective of the study as a research question. It is not sufficient, however, to pose a vague research question such as, Is this particular family intervention program worth it? As Drummond and colleagues (1987) point out, this question can only be answered with more questions, such as, Worth it to whom? and Worth it compared with what? A better research question might be, From the viewpoint of society as a whole, is this new family intervention program preferable to the existing program? Another better-defined possibility is, From the viewpoint of the funding agency, do the benefits of this new family intervention program outweigh the costs?

These more specific questions clearly state the perspective of the study. It is important to specify whether costs and consequences are viewed as accruing to private firms and individuals or to society as a whole. Often, the private viewpoint is too restrictive. For example, a health program's costs might outweigh its benefits from the perspective of a single hospital that provides the program. But if societal benefits outweigh societal costs, efficiency would be enhanced if resources were allocated toward the program so that the hospital or some other institution was willing to provide the program (Drummond et al. 1987). (The term "efficiency" as used here refers to the concept of Pareto efficiency in economics. An allocation is Pareto efficient if no other allocation can make an individual better off without making at least one other individual worse off. If societal benefits are greater than societal costs and the program is not implemented, the current allocation is not Pareto efficient). In most cases, the societal viewpoint is most suitable, particularly for health care evaluations that involve public dollars (Torrance 1986). Partly for this reason, the ALPHA program will be analyzed from the societal perspective.

The evaluator also must describe completely both the intervention under evaluation and its competing alternative(s). The objectives of the intervention and its alternative(s) should be clearly stated. This step is extremely important in part because it highlights the fact that resources used to implement the intervention under evaluation could have been used elsewhere. In fact, Banta and Luce (1983) state that ". . . the

exercise of arraying all possible alternatives (including no action) may be the most important contribution of CEA/CBA." CBA theoretically can be used to determine the worth of an intervention without explicit comparison to an alternative because the benefits and costs are both measured in dollars and can be compared. In most practical cases, however, alternatives exist, and even if the alternative is "do nothing," it must be documented.

The competing alternative to the ALPHA program is the standard elementary school program. Since the at-risk children are randomly assigned to either the ALPHA program or their own school classrooms, the alternative to the intervention was easy to identify in this case. Both the intervention (the ALPHA program) and the alternative (the regular school program) have numerous objectives. Preventing drug use, however, is the main outcome of interest. For the purposes of this evaluation, the objective of the ALPHA program and the regular school program is to educate children so that they remain free of alcohol and other drugs.

At first glance, the regular school alternative may appear to be a do-nothing alternative since there is no program similar to ALPHA that is offered in the standard elementary school classroom. But individual schools and even individual teachers may offer substance use prevention materials and programs to their students—these prevention efforts must be documented to ensure a valid comparison between the intervention and its alternative. This detailed information, however, may not be readily available. In this case, school principals were asked to provide information since centralized school district records did not include data on some school-specific activities.

It is important to be knowledgeable about the alternative(s) early in the evaluation process for a number of reasons. First, the objective of the study cannot be formulated without answering the question, "Compared with what?" Second, the objectives of the alternative(s) probably will affect the methods of analysis chosen (Drummond et al. 1987). For example, if a policymaker is seeking to make a decision between a school-based drug use prevention program and a school and family-based drug use prevention program, then CBA would have to be used instead of CEA because the intervention and the alternative produce different outcomes (Torrance 1986). Finally, users of the study results will need information about the alternatives to decide whether the results apply to their own allocation decisions (Drummond et al. 1987).

3. Research Past Efforts and Choose Methods of Analysis

The objective of the study may lead to a natural choice of a method. For example, if a health department wants to compare two programs with different outcomes, CEA will not be an option. But, in some cases, several methods of analysis may be possible, and the choice of method will depend on a variety of factors. One important factor to be considered is whether the objective of the evaluation is to compare the worth of the intervention's objective with the worth of some other alternative(s)' differing objectives (Drummond et al. 1987). If so, CBA will be more appropriate than CEA, which assumes from the start that the intervention's objective is worth pursuing.

In many cases, practical considerations will dominate the choice of methods. For example, even if CBA is desirable, it may be impossible or very difficult to value all of the outcomes of a particular intervention in monetary terms. Usually, CEA is the "easier" choice when the outcomes are difficult to value in monetary terms. Whether the methods selected are a natural choice or a difficult decision, it is useful to review any existing literature that addresses problems similar to the one under evaluation. Often, the evaluator will be able to reassess and/or refine the choice of methods after reading about problems others have faced in conducting a CBA or a CEA with similar goals.

The economic evaluation of the ALPHA program includes both CEA and CBA. The CEA will allow a cost comparison between the attainment of the ALPHA and the common objectives of regular school programs. For example, final analysis might reveal that compared with participation in the regular school program, participation in the ALPHA program results in a larger reduction in the rate of drug use for the same cost. This finding would suggest to school system officials that the ALPHA program is, from a purely economic viewpoint, a better investment than the regular school program for achieving the desired objective. In this way, CEA is a useful way to compare the costs of achieving certain goals through the ALPHA program and its alternative.

CBA will yield an answer to the question of whether society values the goals of the ALPHA program enough so that the benefits of the program outweigh its costs. Unlike CEA, CBA focuses on the value of the objective itself. Because the ALPHA program is partially funded by public dollars that could be allocated elsewhere, it is important to address this issue.

Very few, if any, researchers have attempted to conduct a CBA/CEA of a school-based substance use prevention program (Plotnick 1994). Even so, evaluations of other prevention programs were useful in refining the study. For example, the evaluation of the costs and benefits of the ALPHA program has been partly guided by strategies used to assess the cost-effectiveness of a chickenpox vaccine program, a back injury prevention program, and a bicycle safety helmets policy (Ginsberg and Silverberg 1994; Lieu et al. 1994; Shi 1993).

4. Review Evidence or Establish Methods of Evaluating Program Effectiveness

It is important to note that the effectiveness of an intervention should be established concurrently or prior to the assessment of how efficiently the intervention is operated. In other words, if they are misused, these economic techniques can uncover the most ". . . efficient provision of ineffective services, i.e., those services which have been shown to do no more good than harm" (Drummond et al. 1987). Obviously, this is an undesirable situation—evaluators do not want to attach the positive label of "cost effective" to ineffective programs and treatments. Ideally, one would like to be sure that the intervention(s) under analysis are effective. Particularly in the case of prevention interventions, this kind of indisputable evidence of efficacy may not be available.

In the case of the ALPHA program, the economic evaluation is a part of a broader effort to assess the effectiveness of the program. A major component of the evaluation is the collection of outcomes data on youth in the intervention and comparison schools. As described in an earlier section, teacher, parent, and child interviews are being conducted to measure the short-run effects of program participation. These outcomes will be linked to a secondary data set to forecast the long-run benefits of the ALPHA program. In cases where the economic analysis is not accompanied by an effectiveness study, Drummond and colleagues (1987) suggest that at least some evidence of the efficacy of the intervention should be presented in the analysis.

5. Identify and Define Measurement Units for Costs and Benefits

At this point, the evaluator has defined a specific problem and objective and has selected the methods that will be used to conduct the analysis.

The next logical step involves two parts. First, the evaluator must identify the following:

- All of the costs of the intervention and its alternative(s).

- All of the outcomes of the intervention and its alternative(s). (This information already may have been identified if an effectiveness evaluation is being conducted concurrently.)

Second, the evaluator should specify the units of measurement that will be used to describe these costs and outcomes (Drummond et al. 1987).

Identification of the costs of the intervention and its alternative(s) requires that all of the resources consumed by the programs are documented. As described earlier in this chapter, costs include direct costs, indirect costs, and intangible costs (Torrance 1986). Direct costs generally are the operating expenses—for example, the direct costs of the ALPHA program include teachers' salaries, supplies, and building rent, as well as financial indirect costs such as administrative overhead. Direct costs would also include any fees participants might incur (Drummond et al. 1987). Since the ALPHA and the regular school programs do not charge participants for their services, these direct costs were not documented.

Indirect costs refer to lost production that can be attributed to participation in the intervention or its alternative(s). For example, if a smoking cessation intervention required participants to attend an hour-long session each week, the cost of the participants' time must be included as a cost of the program. The opportunity cost of an hour is the wage that the participant could have earned had he or she worked that hour. In the case of the ALPHA program, indirect costs do not seem relevant since children's time cannot be valued with a market wage.

Intangible costs include any emotional hardship that can be attributed to the program (Torrance 1986). For example, some interventions that target high-risk youth carry a stigma and may make it difficult for a participant to ultimately socialize with peers or colleagues. Although for some interventions this factor might be important, it is not expected to be a major issue with ALPHA participants because all high-risk youngsters have an opportunity to participate in ALPHA through random assignment. Furthermore, ALPHA is viewed as an enrichment program. It is unlikely, then, that intangible costs are a significant factor.

Nevertheless, the ALPHA project incorporates this possible unintended consequence by questioning parents, teachers, and ALPHA participants about stigma during the transition period when students return to their regular classrooms. If stigma is found to exist, it will be included as an intangible cost of the ALPHA program. It is important to note that intangible costs are often difficult or impossible to value in monetary terms. Even so, if they are important, intangible costs should be included in an economic evaluation.

After the direct, indirect, and intangible costs have been identified, the outcomes must be addressed. For the intervention and its alternative(s), outcomes refer to the consequences or the effects that can be attributed to participation. Like costs, benefits can be divided into direct and indirect categories. Direct benefits are reductions in health care costs that can be attributed to the intervention (Drummond et al. 1987). For example, the direct benefits of the ALPHA program may include reduced mental health services utilization or fewer encounters with the juvenile justice system.

Indirect benefits are productivity gains—for example, a heart disease prevention program may prolong the working lives of its participants. Because ALPHA program participants are children, it is difficult to measure productivity gains through traditional labor market indicators such as the wage and hours worked. Currently, ALPHA project evaluators are working to substitute measures of school productivity for labor force productivity and to estimate long-run indirect benefits through use of a secondary data set. Nevertheless, at this point the issue of indirect benefits remains very controversial in the literature (Drummond et al. 1987). Furthermore, the issue of indirect benefits of children's prevention interventions has not been addressed in the literature.

So far, this chapter has addressed the issue of direct and indirect economic benefits. Many of the benefits of a prevention intervention, however, may not be economic—for example, the ALPHA program may improve quality of life for children and their families. These changes in quality of life, as well as other emotional and psychological benefits, should be documented.

Once the costs and the benefits of the intervention and its alternative(s) have been listed, the units of measurement for each item must be specified (Drummond et al. 1987). In some cases this task will be easy,

but in other situations, finding a suitable unit of measurement may be challenging. It may be useful to list costs, benefits, and their units of measurement in a table form for easy reference. For the ALPHA program, this type of table might look like table 1 below.

TABLE 1. *ALPHA program.*

Direct Costs	Unit of Measurement
Teacher salaries	Yearly salary in dollars
Building	Yearly rent in dollars

6. Collect Necessary Data

The process of data collection will vary widely across evaluation projects. It is useful to develop (or adapt) a data collection instrument to ensure that comparable information is obtained from both the intervention and the alternative. Information on the costs of the ALPHA intervention and the alternative is collected using a data collection instrument that was modified from a Research Triangle Institute cost guide (Research Triangle Institute 1993). The main objective of the collection effort is to determine the costs per student in the ALPHA program and in the regular school program.

Initially, the authors thought it would be possible to obtain cost-per-student data from Florida School Reports, but it was found that the data did not sufficiently disaggregate costs for analysis. The authors decided to develop a cost instrument that could better ensure the analysis of comparable information from the ALPHA intervention program and the school system's usual and customary practices with at-risk students. A survey instrument was designed based on a Research Triangle Institute questionnaire used to measure the costs of drug treatment programs. The instrument documents number of students, program revenue, expenditures, and in-kind contributions such as donated personnel, supplies, and facilities. Since many elementary schools also maintain internal budgets, the questionnaire includes sections that request information from the individual school as well as the centralized budget office.

A pretest was conducted of the cost instrument in a neighboring school system in Florida. After revising the cost instrument based on the comments and experience of the pretest, the authors are now collecting project cost data. A school budget official was asked to complete one questionnaire for each of the six project schools using centralized records. Each principal at a project school will complete a designated set of questions about information that is not available in centralized records. An Operation PAR budget official will fill out a single-cost questionnaire for the ALPHA program for each year. Information obtained from this process will be used to calculate a cost-per-student figure for the ALPHA program and for each of the six schools. The cost per student in the ALPHA program will be compared with the cost per student in the regular elementary school programs. As described in step 4 above, outcomes or benefits data will be obtained from the effectiveness portion of the evaluation.

7. Analyze Costs and Benefits for the Intervention and Its Alternative

Once the data have been collected, values must be assigned to costs and, in the case of CBA, to benefits. Normally, most costs already will be measured in dollar terms. Drummond and colleagues (1987) point out, however, that ". . . the objective in valuing costs is to obtain an estimate of the worth of resources depleted by the programme."

Volunteer labor and donated goods, therefore, must be included as costs, even though they are free from the perspective of the program. These items must be assigned dollar values even if they are not recorded in this manner. For example, an intervention may utilize 100 volunteer hours. These hours can then be multiplied by the average wage the volunteers would have earned had they spent their time doing paid work. The product will estimate the value of resources used. For some interventions, donated time and goods may be a large portion of costs.

At this point, the information collected can be summarized. In CEA, summary measures are usually cost in dollars per unit effectiveness ratios. Effectiveness measures are either final health outputs such as "life years gained" or intermediate health outputs such as "cases found" (Drummond et al. 1987). A summary statistic commonly used in CBA is net benefits. The net benefits of an alternative are the benefits minus the costs, both of which are measured in dollars.

8. Establish a Range of Values for Costs and Consequences

It is also very important to adjust future costs and benefits through a procedure called discounting. The purpose and process of discounting are best described with an example. Most people are familiar with the concept of gaining interest on an investment. Assume the rate of interest is 10 percent. After a year in the bank, a $100 savings account will be worth $110. Discounting reverses this relationship—this reversal implies that $110 received a year from now is worth only $100 today (Banta and Luce 1983). The present value of $110 received next year is $100.

In other words, discounting accounts for the fact that $100 received now is worth more than $100 received a year from now because money received now can earn interest in the bank for a year. In general, people prefer to receive benefits earlier rather than later and prefer to incur costs later rather than earlier. Although discounting is not difficult, an evaluator should consult one of the references or published studies to see more examples of the method.

Discounting should be performed if benefits and/or costs occur more than 1 or 2 years into the future (D. Salkever, personal communication, January 1996). For prevention interventions, benefits are often realized far into the future. Because these benefits are heavily discounted, they may appear to be worth very little.

The issue of discounting becomes controversial when the choice of interest rate is disputed. Usually, a rate of 2 to 10 percent is considered to be consistent with economic theory—5 percent is a commonly used rate (Drummond et al. 1987). Often, the evaluator will try a range of rates to assess the implications of "worst-case" and "best-case" scenarios (Banta and Luce 1983). This process is called sensitivity analysis and is now considered to be an essential element of a cost-benefit or cost-effectiveness evaluation (Drummond et al. 1987).

Sensitivity analysis is not limited to analysis of the interest rate. Any uncertain assumptions or figures should be assigned different values to see whether these changes affect the results or the conclusions of the study. If the results or conclusions of the study are the same over a range of values and assumptions, the evaluator can make a recommendation with a degree of confidence. If not, the evaluator

should list the range of values or assumptions that correspond to a specific result (Drummond et al. 1987).

For example, the evaluator might specify that project A is cost-effective compared with project B at interest rates between 0 and 7 percent. Another example might be a stipulation that project A is cost-effective compared with project B, assuming that indirect benefits are included in the analysis. This statement implies that the results or the conclusions of the study may be different if indirect benefits are not included.

9. Compare Intervention and Alternative

In a CEA, cost-per-unit effectiveness ratios can be compared across programs. For example, if project A has a ratio of $10 per life-year gained, and project B has a ratio of $15 per life-year gained, project A is the most cost-effective alternative. That is, compared with project B, project A achieves the same goal at a lower cost.

CBA results may be summarized by stating net benefits. The existence of positive net benefits implies that society values the benefits of the alternative more than it values the costs. Theoretically then, any alternative with positive net benefits should be implemented. Net benefits also can be compared across alternatives.

10. Address Ethical Issues, Scope, and Ramifications of the Study

It is important to recognize that every economic evaluation is based on assumptions that may have ethical implications. The evaluator should state explicitly all major assumptions made in the analysis and address the ethical ramifications of these assumptions. For example, the human capital approach described above essentially values human beings by their expected lifetime earnings. One problem with this approach is that elderly people would be assigned low values since they may no longer work.

If this implication is not stated in the analysis, users of the study results might misinterpret the findings and make undesirable policy decisions. Banta and Luce (1983) point out that ". . . quantitative results are powerful and may overwhelm the policymaker with a false sense of security." It is the evaluator's responsibility to prevent this possibility by uncovering and discussing any implicit assumptions that may have been

made in the analysis. This way, those who use results from CBA/CEA studies will understand the scope and ramifications of the ethical judgments that underlie the process of economic evaluation.

Although CBA and CEA can be very useful tools in decisionmaking, the methods are not without limitations. Economic evaluation focuses on efficiency rather than equity. Equity, however, might be one of the goals of an intervention. Other noneconomic factors will be important in making a decision on the worthiness of a particular program. Results from economic evaluations might have great impact on decisionmaking but should not be the only factors that are considered.

REFINEMENT AND DISSEMINATION OF COSTS AND BENEFITS METHODS FOR THE DRUG ABUSE PREVENTION RESEARCH AND SERVICE COMMUNITIES

The objective of the previous section was to clarify economic evaluation methods by outlining 10 major steps in the process. It is important that program evaluators as well as the users of CBA/CEA studies understand these steps for a number of reasons. First, there is a need in general for high-quality economic evaluations. Elixhauser and colleagues (1993) report that the number of cost-benefit and cost-effectiveness studies published yearly rose from 5 in 1966 to 251 in 1990. This rapid increase in the quantity of research done in this area has led to serious questions about the quality of the investigations. Some researchers estimate that about half of the published studies do not follow even the basic tenets of economic evaluation (Elixhauser et al. 1993). Concerns about quality and misinterpretation of results suggest that the basic principles of CBA and CEA are not widely understood.

Second, it is important that more drug abuse prevention programs undergo economic evaluation. Public policymakers are currently choosing to reduce funding for drug abuse prevention initiatives while maintaining dollars devoted to supply reduction efforts that largely rely on the use of law enforcement officials. The inability to answer, with confidence, the perennial question of "what works" has attenuated policymakers' support for even those drug abuse prevention efforts that have documented evidence of success.

Moreover, indications that adolescent drug use is increasing has made some policymakers question whether the benefits of investing in drug

abuse prevention programs are worth the costs. With the fast pace of changes in Federal policy and the limited number of researchers skilled in conducting research in this area, there is a need to enhance the capacity of existing resources to respond to requests for information on the costs and benefits of drug abuse prevention policies and programs.

The authors propose a two-pronged approach to refining methods for documenting costs and estimating benefits of drug abuse prevention. The first would involve the research community. The research community would review existing costs and benefits methods, develop consensus about a core set of cost measures and a core set of short-term outcomes, and collaborate on estimating the long-term economic consequences of early drug use. The second approach would involve practitioners (e.g., drug abuse service providers and staff of key policymakers) who would contribute to the development of costs and benefits methods by providing input on the usefulness of the core set of cost and outcome measures for drug abuse prevention services. It is hoped that this chapter initiates progress toward these objectives and also stimulates the formation of a network of researchers and practitioners interested in the application of CBA and CEA to drug abuse prevention programs.

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ACKNOWLEDGMENTS

The authors acknowledge the encouragement and support of their colleagues in developing costs and benefits methods for drug prevention research, especially David Salkever at Johns Hopkins University; Shirley Coletti, Randy Ratliff, and Joe Citro at Operation PAR, Inc.; Howard Hinesley, Steve Iachini, Dee Walker, and Deril Wood at Pinellas County Schools; Linda Miller and the staff of the ALPHA program; and Daphne Lampley, Nancy Helt, and the staff of the Alpha Prevention Project. This chapter was supported by National Institute on Drug Abuse grant no. 5 R01 DA08234, Impact of a Drug Prevention Program for At-Risk Children.

AUTHORS

Pinka Chatterji, M.A.
Ph.D. Candidate
Department of Health Policy and Management
Johns Hopkins University School of Hygiene and Public Health
Project Evaluator
Alpha Prevention Project

Lisa Werthamer, M.S.W., Sc.D.
Assistant Professor
Department of Mental Hygiene
Johns Hopkins University School of Hygiene and Public Health
Principal Investigator
Alpha Prevention Project

Marsha Lillie-Blanton, Dr.P.H.
Assistant Professor
Department of Health Policy and Management
Johns Hopkins University School of Hygiene and Public Health
Co-Principal Investigator
Alpha Prevention Project

615 North Wolfe Street
Baltimore, MD 21205

Christine Caffray
Ph.D. Candidate
Department of Experimental Psychology
University of South Florida
Project Evaluator
Alpha Prevention Project
2620 Wrencrest Circle
Valrico, FL 33594

A Public Health Perspective for Research on Family-Focused Interventions

Anthony Biglan and Carol W. Metzler

INTRODUCTION

The ultimate goal of drug abuse prevention research is a reduction in the prevalence of the abuse of drugs. Keeping this goal squarely in front of researchers can play an important role in organizing an agenda for research. This chapter examines the implications of this research agenda for family factors influencing young people's substance abuse or other problem behaviors.

Focusing on the prevalence of a problem in a defined population is the essence of a public health perspective (Winett et al. 1989). Such an orientation has its roots in medicine's efforts to control epidemics. An epidemic of an infectious disease, such as influenza or polio, is a dramatic event that naturally leads to a focus on the goal of reducing the number of people who are stricken or die. As the role of behavior in health has become clearer, however, the public health community has increasingly adopted goals of reducing the prevalence of unhealthy behaviors, such as smoking, inactivity, and fat consumption (Luepker et al. 1994).

Although the two need not be in conflict, the public health perspective can be contrasted with a clinical perspective. In a clinical perspective, the focus is on a family interventionist's ability to "cure" or ameliorate cases that come to his or her attention. Historically, the natural tendency has been for the clinical perspective to predominate, largely because researchers were confronted with persons in need of treatment long before understanding how problems might be prevented or more efficiently ameliorated through nonclinical means. An important side effect of this history is that many more organizational resources are committed to clinical interventions than might be the case if a fresh start were made and the authors began with the question of how to most efficiently reduce the prevalence of specific problems.

Both the clinical and public health perspectives are to be found in efforts to address youth problem behavior. Increasingly, data are available on the incidence and prevalence of problems such as substance use (Johnston et al. 1985) and juvenile crime. Progress and failure are measured in terms of changes in these population-based statistics. Efforts to reduce these problems include universal and selective interventions (Mrazek and Haggerty 1994), such as media that target large numbers of people and clinical interventions that target individual youths or small groups.

Nonetheless, the majority of family-focused interventions are clinical, involving individual families or small groups of families. This is understandable. It is in the nature of science to begin with problems it can address. Figuring out how to assess and affect parent-child interactions in beneficial ways was the appropriate first step.

However, a great deal of progress has been made on these fronts. As a result, it is not too early to devote scientific resources to research on how to increase the number of families that nurture their children to become successful and productive adults.

This chapter outlines a research agenda that would contribute to researchers' ability to reduce the prevalence of substance abuse and other problem behaviors through family-focused interventions. Such an agenda would include further improvements in the efficacy of clinical interventions, such as increasing involvement with hard-to-engage families in treatment; ensuring that interventions are appropriate and effective with diverse populations; and overcoming barriers to successful outcome, such as insularity and depression. This research agenda would also involve assessing and improving the cost-effectiveness of clinical interventions.

If researchers are going to reduce the prevalence of these problems, however, they must go beyond research on clinical interventions. Systematic research is needed on how to increase the number of organizations that provide validated family interventions and on whether the prevalence of effective parenting practices can be increased through other channels such as media and school-prompted parent-child activities. Researchers also need to examine whether communities can be assisted in supplementing limited parental resources by, for example, developing better supervised recreation or creating mentoring programs for youth whose parents are not likely to provide adequate guidance and

supervision. Finally, systematic research is needed on the effects of public policies on parenting practices and family functioning.

ROLE OF THE FAMILY IN PREVENTING SUBSTANCE ABUSE AND OTHER PROBLEM BEHAVIORS

Studies described in the literature, including those in the other chapters of this monograph, document the critical role that specific parenting practices play in the development of children and adolescents. The evidence can be summarized in terms of two generalizations.

First, there is increasing evidence that drug abuse among young people is associated with engagement in diverse problem behaviors (Barnes 1984; Biglan et al. 1990; Brennan 1979; Donovan and Jessor 1985; Donovan et al. 1988; Dryfoos 1990; Elliott and Morse 1987; Epstein and Tamir 1984; Farrell et al. 1992; Hawkins et al. 1986; Jessor 1987*a*, *b*; Jessor and Jessor 1977*a, b*; Loeber and Dishion 1983; Malcolm and Shephard 1978; Miller and Simon 1974; Osgood et al. 1988; Vingilis and Adlaf 1990; Wechsler and Thum 1973; Welte and Barnes 1987; Zabin 1984; Zelnik et al. 1981). Multivariate analyses have shown that a single common factor can account for the relationships among the behaviors (Donovan and Jessor 1985; Donovan et al. 1988; Farrell et al. 1992; Osgood et al. 1988). Where sex differences have been investigated, these interrelationships have been found to hold for both males and females (Donovan and Jessor 1985; Farrell et al. 1992).

Second, there is now considerable evidence about the kinds of parenting practices that influence the development of youth problem behavior. This evidence constitutes a prescription for family-focused prevention efforts. Perhaps the most consistently identified parenting practice influencing youth problem behavior is monitoring. Preadolescent and adolescent youth whose parents keep track of their activities are significantly less likely to engage in problem behavior (Biglan et al. 1994, 1995; Dishion et al. 1996; Patterson 1996).

Another important parenting practice involves effective discipline. In a recent review of the work at Oregon Social Learning Center, Patterson (1996) presented data from three samples indicating that parents who ranked high on the "inept discipline" construct were significantly more likely to have children who engaged in antisocial behavior. Inept discipline involves the use of harsh and inconsistent discipline, in which

parents often criticize or "natter" at the their children but do not follow through with nonharsh consequences for inappropriate behavior.

A final category of parenting practice that may be important involves parents' positive involvement with their children. It seems natural to assume that parents who have enjoyable and mutually reinforcing interactions with their children are more likely to have children who become socially skilled and continue to be influenced by their parents. Surprisingly, there is less clear evidence of the value of such parent-child bonding than there is of the harm of inadequate monitoring and discipline (Patterson et al. 1992). Positive involvement between parents and children is likely to facilitate more effective monitoring and discipline practices but may itself have a more distal relationship to child problems. Certainly, promotion of positive parent-child interaction has been viewed as an essential component of family interventions in the service of more effective family functioning.

In summary, the evidence identifies a set of parenting practices that is critical to ensuring children's successful development. In the absence of these practices, children are more likely to develop a range of problem behaviors, including substance abuse and antisocial behavior. It is time to examine whether the prevalence of youth problem behaviors can be reduced by increasing the prevalence of effective parenting practices.

EFFICACY OF FAMILY INTERVENTIONS

There is a great deal of evidence supporting the efficacy of family-focused interventions. The chapters in this monograph document much of this evidence. There is growing evidence that parenting skills training programs can benefit parents and children, for parents of both preschool and elementary school-age children (Kumpfer 1996; Webster-Stratton 1981*a, b*, 1982*a, b*, 1984; Webster-Stratton et al. 1988, 1989) and middle school children (Dishion and Andrews 1995). Szapocznik's (1996) line of research has shown that both family functioning and child substance abuse are affected by strategic structural family interventions. Henggeler and colleagues (1986) have shown that a family intervention that addresses the multiple factors affecting family functioning leads to reductions in youth problem behavior and improvements in family functioning. Olds and Pettitt (1996) have shown that a program of prenatal and early childhood home visitations to mothers of at-risk

children can reduce the risks of substance abuse and antisocial behavior among children.

In short, sufficient evidence exists about the value of family interventions that it is appropriate to turn to the question of how existing knowledge can be translated into increases in the prevalence of effective parenting practices. There are a number of natural next steps that need to be taken by family intervention researchers.

Efficacy of Parenting Skills Training for Diverse Cultural Groups

Most of the existing research has been done with white, largely middle-class samples that were not even representative of that cultural group. One cannot be sure that such programs will be effective with other cultural groups, although the work of Szapocznik and colleagues (1996) at the University of Miami (1996) indicates that interventions targeting family interactions are beneficial with Hispanic families. Research that adapts and evaluates programs with other cultural groups is a necessary step in shaping the ability of family interventionists to increase the prevalence of important parenting practices.

Participation

One of the most important barriers to increasing the prevalence of good parenting practices is the fact that many parents who would benefit from family interventions do not participate in them. Indeed, some of the same factors that put families at risk for youth problem behavior are also factors associated with nonparticipation in family-focused interventions. For example, single parents and parents with lower incomes, lower educational levels, less social support, more family conflict, and more extrafamilial conflict are more likely to have children with behavior problems (Dumas 1986; Patterson 1982, 1996; Wahler 1980). Families with these characteristics are also less likely to enter parent training or parent support programs (Fontana et al. 1989; Hawkins et al. 1987; Herzog et al. 1986; Weber and Stoneman 1986) or to continue in parent training once they have begun (Albin et al. 1985; Holden et al. 1990; McMahon et al. 1981; Powell 1984).

Spoth and his colleagues have made some promising beginnings on this problem. Spoth and Redmond (in press) and Spoth and colleagues (1995) found that level of attendance at parenting programs predicted

later child management behaviors. Spoth and associates (in press) applied methods from marketing to identify preferences of parents for different types of family-focused programs. Spoth and Redmond (1994) compared two methods of recruiting parents to family-focused prevention programs. One method involved asking families to commit to the entire project (i.e., pretest assessment, treatment, postassessment) at the outset. In the other method, families were first asked to participate in the pretest and only later were asked to be in the treatment component. The former method of recruitment led to fewer families dropping out of the study.

In perhaps the most interesting study, Spoth and others (submitted) examined the factors that predicted nonparticipation in a family program. Among the factors influencing nonparticipation were time and scheduling issues, parents' perceptions that their children were at low risk, and concerns about assessment and privacy. These findings point to ways that programs and their recruitment procedures might be designed to enhance participation.

In a very promising study, Szapocznik and colleagues (1988) also evaluated a method of increasing family participation in treatment. They compared a strategic structural system (SSS) approach to achieving family engagement with the usual method of engaging families (limited to phone contact prior to the first treatment session). The SSS engagement procedure involved analyzing the structure of the family that might indicate which family members were likely to resist and which family members would control the family's decision to get involved in treatment. Then the family therapist attempted to achieve rapport with the key family members, helping the family member who had called to involve other family members. The therapist would visit the family in the home, if necessary. They found that, compared with traditional limited efforts to recruit families, the SSS approach was much more effective (58 percent in traditional approach did not get involved versus 7 percent in the SSS method).

Even with substantial improvement in the ability of family interventionists to engage families, it is unlikely that it will be possible to engage every family that needs assistance—even if sufficient treatment resources were available. Thus, additional methods of promoting effective parenting practices need to be explored.

Identifying and Overcoming Barriers to Successful Outcomes

The efficacy of family-focused interventions will be enhanced by research on how barriers to the efficacy of such programs can be overcome. Among the barriers that have been identified are maternal insularity and stressful events such as aversive encounters with family members (McMahon et al. 1981) and service providers (Wahler 1980). Parenting programs that address these problems can be expected to be more effective than those that do not, although experimental evaluations of this question are presently lacking. In addition, research is needed on other factors that may interfere with families' success in parenting programs.

DISSEMINATION OF VALIDATED FAMILY INTERVENTIONS

Given the existence of validated family interventions, a portion of research resources should be directed toward identifying the most effective ways to ensure that these programs are widely adopted. Across most areas of social interventions, this problem receives little systematic attention. Dissemination is often seen simply as a process of informing others about an efficacious program. Even when the originators of a validated program organize themselves to train others in its use and to monitor the quality of implementation, they are unlikely to conduct systematic research on the efficacy of their dissemination efforts.

This is understandable. There is little reason to expect that family intervention researchers, who have spent years struggling with how to design and refine effective programs, will have the background, experience, or interest to learn how to influence other organizations to adopt such programs. They may be well versed in how to train interventionists, but they are unlikely to be well informed about the kinds of factors that influence organizations to adopt or maintain programs.

Several research questions in this area need to be pursued. The first, and most obvious, involves how best to train change agents to implement the family intervention so that the same results are achieved in dissemination as have been obtained in research studies. As just suggested, many family interventionists are well equipped to provide training to would-be providers. However, systematic experimental evaluations of training and quality monitoring procedures are seldom conducted.

If parent training and other family-focused interventions are to become widely available, research on organizations is also needed. The types of organizations that are most able to provide validated family interventions need to be identified. For example, schools, voluntary and government-funded family welfare agencies, churches, child care providers, and fee-for-service private practitioners are all potential providers of these programs. Research is needed on which types of organizations are currently providing family intervention programs and whether those programs are based on the best available evidence about efficacy. Such information would form the groundwork for systematic efforts to increase the availability of efficacious interventions.

Research is also needed on how to influence organizations to adopt and maintain effective programs. That is, Which factors would influence each of the types of organizations listed in the preceding paragraph to adopt and maintain a family-focused intervention? Biglan (1995) has analyzed some of the factors that appear to influence the actions of organizations. In general, the outcomes of an organization's actions appear to be the most important factors influencing those actions over the long term. For most types of organizations, the most important of these outcomes are economic. Organizations that do not achieve economic results that allow them to continue to operate will cease to exist or will change their activities in the interest of survival. This is obvious in the case of business organizations, but it is just as applicable to nonprofit organizations.

The focus on the consequences of program adoption might be contrasted with the tendency to think in terms of the antecedents of an organization's adoption of a program. Researchers are accustomed to emphasizing factors such as the belief of the decisionmakers about the value of the program and its consistency with the organization's mission. In the short run, these factors are indeed pivotal. However, if the program to be adopted does not contribute to the long-term well-being of the organization, it is unlikely to be adopted or maintained.

Thus, analyses are needed of the economic consequences to organizations for their adoption and maintenance of family-focused interventions. Because much of the money for family-focused interventions comes from charitable and public sources, analyses of the economic contingencies for provider organizations will, in turn, beget analyses of the contingencies influencing organizations that fund them, such as school districts, foundations, and governments. Here, too, it will be necessary to

understand what influences the funding organizations' initial and continued support. Thus, a thoroughgoing analysis of the context for program adoption must examine the factors influencing the organizations and collectivities (e.g., voters) that decide on funding.

In summary, research is needed on (1) the types of organizations that are providing, or might be willing to provide, family-focused interventions; (2) the consequences to organizations for their adoption and maintenance of such programs; and (3) influences on organizations and collectivities that determine whether provider organizations will be funded to provide such programs.

Such a line of research may seem onerous to those who are already working very hard on the development and evaluation of family interventions. But it is difficult to see how the fruits of the outstanding work that has been done will be realized if researchers do not begin to study the larger social context that influences program adoption and maintenance.

COST-BENEFIT ANALYSIS

Dissemination of efficacious parent and family interventions will be facilitated by better evidence about their costs and benefits. Presumably, organizations will be less willing to adapt programs that are very costly (though many will probably not be sensitive to issues of their proven efficacy). Werthamer-Larsson (1996) has provided a useful analysis of the evidence and methodological issues relevant to assessing the costs and benefits of family interventions.

Comparison of the costs of family interventions with the costs of other social interventions intended to prevent youthful problem behaviors are also valuable. For example, Greenwood (1995) has shown that parenting skills training is a far less expensive method of preventing crime than is incarceration.

METHODOLOGICAL CONSIDERATIONS

The same standards that have led to effective family interventions are needed for dissemination research. Specifically, experimental evaluations of the efficacy of dissemination strategies are needed. These

evaluations are needed for the same reason that they are needed in any other area of research: Without them, researchers will not identify the most effective ingredients in dissemination efforts.

Experimental designs need not be randomized controlled trials. Such designs would be quite costly, as they would require the randomization of numerous organizations to receive or not receive the dissemination program. Rather, at this stage of researchers' knowledge, it would seem appropriate and feasible to conduct repeated time-series experiments, in which baseline data on organizational practices are obtained from several organizations and the effects of the dissemination strategy are evaluated on one organization at a time (Biglan 1995).

It is not too early to begin research of this sort. Webster-Stratton (personal communication, January 1996) is already assisting the State of Delaware in implementing its parenting skills program throughout the State. Systematic research on such efforts will ultimately contribute a higher likelihood of success in such important undertakings.

BEYOND CLINICAL INTERVENTIONS

Even if researchers were to become extraordinarily skilled in disseminating effective family interventions, it is unlikely that this development, by itself, will produce sufficient reductions in the prevalence of poor parenting practices. Resources are not available to pay for programs for everyone who needs them, and even if they were, many families would be unwilling to participate.

This situation parallels that in tobacco control research 15 years ago (see Lichtenstein et al. 1991). At that time, most research focused on developing effective smoking cessation programs. It eventually became clear that the majority of those who wanted to quit smoking would not participate in such programs. Moreover, many people could be influenced and assisted in quitting through other means, such as advice from physicians, media, and smoking policies and programs at the worksite. Because lowering the prevalence of smoking was the clear goal for tobacco control research, it was only natural to begin to explore these other means of reducing its prevalence.

The field of family-focused prevention intervention has not been as clear about its goal. Can there be any doubt, however, that the ultimate

success of researchers' efforts should be measured in terms of the degree to which they reduce the *number* of young people in society who develop any of the costly problem behaviors of youth such as substance abuse or delinquency.

To move toward this goal, researchers need to systematically explore all of the ways in which family functioning can be enhanced.

Media

There is persuasive evidence that mass media can influence important health and social behaviors. Warner (1977, 1989) described how the 1964 Surgeon General's report and the requirement for television ads recommending smoking cessation were associated with reductions in the prevalence of smoking. Flay (1987a, *b*) reviewed evidence that media campaigns influence smokers to stop smoking or attempt to stop. Media effects have also been reported in studies of crime prevention (O'Keefe and Reid 1990), alcohol consumption (Barber et al. 1989), and drunk driving (Niensted 1990).

There has been surprisingly little research, however, on how media might influence parenting practices. Hawkins and colleagues (1987) made extensive use of media in recruiting parents to a parenting program. However, they did not assess the effects of the media on parenting practices, nor did they experimentally evaluate the effects of media in recruiting parents. Pentz and associates (submitted) reported that a school and community intervention that included media had a significant impact on substance use. Given the design of the study, however, the unique effects of media on parenting practices could not be determined.

The primary use of media would likely be to influence parenting practices. Media could also be an important means of motivating parents to participate in formal programs. The media channels that might be used include radio, television, direct mail, videotapes, and the Internet.

Media interventions may not remediate serious and longstanding deficits in parenting practices in many families. They do have the potential, nevertheless, to influence much larger numbers of families at a much smaller cost per family than clinical interventions. Research is needed to determine whether the effects that could be achieved through media are sufficient to influence the prevalence of youth problem behavior.

Here, too, systematic experimental evaluation is needed. As noted, repeated time-series experiments provide a more efficient means for evaluating media interventions than randomized controlled trials (Biglan 1995).

School Influences on Parents

It may also be possible to influence parenting practices through activities that are assigned in school. Biglan and colleagues (in press) tested the effects of a school-prompted quiz about tobacco that middle school students gave to their parents. The activity significantly increased the proportion of parents who were exposed to antitobacco messages, improved parents' knowledge about tobacco, increased their support for community efforts to prevent youth tobacco use, and increased parent-child communication about tobacco use.

Schools could do a great deal more to influence parenting practices. First, they could routinely screen children to identify those whose parents might benefit from parenting skills training or other family interventions (e.g., Walker et al. 1994). Second, schools could provide parenting skills programs or other family-focused interventions. Increasingly, schools are becoming a hub for the delivery of a range of services to children and their families. Third, they could provide a "steady drumbeat" of information to parents about effective parenting, through newsletters, handouts, and workshops. Fourth, they could publicly recognize parents' successful efforts.

The Neighborhood or Community *in Locus Parentis*

Due to increases in the prevalence of single parenting and the increased tendency in two-parent families for both parents to be working (Marshall 1991), society has developed a parental labor shortage. As a result, there are limits to how much can be accomplished solely by trying to influence parents to spend time with their children, to monitor their activities, and to set effective limits on problem-promoting activities. In addition, a greater amount of parental involvement is needed to prevent problem behavior in neighborhoods and communities that have a high density of criminal behavior (Sampson 1993). Thus, it is in the interest of communities to supplement parental monitoring and supervision. There are at least three actions that communities can take to augment parental efforts: supervised recreation, mentoring, and policy change.

Supervised Recreation. Supervised recreational activities show potential for preventing youth problem behaviors, through reducing the amount of time that young people have available to engage in problem behavior and through fostering skill development that increases their opportunities to achieve reinforcement from prosocial activities.

Unfortunately, very little empirical evaluation of supervised recreation has occurred. The only study the authors found was conducted by Jones and Offord (1989), a quasi-experimental evaluation of organized recreational activities for young people in a low-income housing project. Compared with a similar project in which no programs were provided, the incidence of antisocial behavior was reduced in the project receiving the recreational program. Mendel (1995) cites evidence that the initiation of a midnight basketball program was associated with a decrease in drug-related crime but acknowledges that the effects of such programs have not been formally evaluated. Mendel also cites a study indicating that housing projects with Boys and Girls Clubs had less crime than projects that did not have such clubs. However, this may be because projects with more law-abiding people in them are more likely to institute and maintain such clubs.

Thus, experimental evaluations of the effects of supervised recreation on youth problem behavior are needed. Large sums of money are being spent on recreation in U.S. communities (Smith 1991); one of the justifications for these expenditures is that they are assumed to prevent youth problem behavior. These assumptions are based on little research, however. If experimental evaluations indicate the value of such programs, research will then be needed on how communities can be assisted in generating resources to support them.

Youth supervision might also be increased by increasing adult monitoring of the activities of youth in public places. Every community has some times and locations where at-risk young people congregate and engage in problematic behavior. Communities that identify those places and times and develop systematic ways of discouraging problem behavior or encouraging prosocial behavior in those settings may reduce the rates of problem behaviors. Activities may include targeting supervised recreation for the times that youth are most likely to congregate in problem places and providing police and civilian patrols of problem places at problem times.

Mentoring. If parenting practices cannot be influenced, other members of the community may be able to supplement parents' efforts. Davidson and colleagues (Davidson and Basta 1989; Davidson and Redner 1988; Davidson et al. 1987) have developed and carefully evaluated a program of mentoring that is delivered to young people who have been arrested for a criminal offense. The program involves intensive training of college undergraduates who commit to spending 6 to 8 hours a week with a single youth for 18 weeks. The mentor functions as a friend and as a change agent, helping the youth to establish goals and organizing social support and access to community resources for the youth. In two experimental evaluations of the program, Davidson and colleagues (Davidson and Basta 1989; Davidson et al. 1987) compared youth who were randomly assigned to the program with youth who were randomly assigned to usual care. In both studies, the program significantly reduced the rearrest rate.

Policy Change. The policy arena is another area where family interventionists might emulate tobacco control efforts. Increasingly, tobacco control advocates are relying on changes in law and policy to achieve reductions in the prevalence of tobacco use (U.S. Department of Health and Human Services 1993*a*, 1994). Evidence suggests that increased taxation on tobacco reduces its use (U.S. Department of Health and Human Services 1994). Worksite policies to curtail smoking and to encourage employees to quit have had beneficial effects (Fisher et al. 1990). As evidence for the harm of passive smoking has mounted (U.S. Department of Health and Human Services 1993*b*, 1986), laws and regulations prohibiting smoking in public places have increased dramatically (U.S. Department of Health and Human Services 1993*a*). Evidence that most smokers become addicted as adolescents has led to extensive Federal, State, and local efforts to reduce illegal sales of tobacco to young people (U.S. Department of Health and Human Services 1994). In essence, the tobacco control community has attempted to change any policy or law that seemed likely to influence the prevalence of smoking or smokeless tobacco use.

Increasing the prevalence of good parenting is undoubtedly a more complex problem. Yet there are key policy areas where changes in law or policy might improve outcomes for children. These include welfare, divorce and custody laws, family leave, provision of child care, and mandatory parent training under certain circumstances.

An important question in all of these policy arenas is, To what extent is good research available and being used to guide policy changes? For example, welfare reform is currently a matter of much discussion. Many argue that the current welfare system promotes dependency and undermines two-parent families. Whether welfare policies are revised in ways that benefit parenting remains to be seen. Certainly there is no evidence to suggest that increasing the economic hardship of families by cutting off welfare for them will decrease their risk, and such approaches as 2-year limits on cash benefits and withdrawal of benefits for children born out of wedlock are entirely untested (Aber et al. 1995). The counterargument, however, is that such tightening of welfare will increase the likelihood that families will become self-sufficient and that women will avoid single parenting (Frum 1994). Although there have been "experiments" with welfare reform, few have systematically examined the effects of these policies on parenting and on children.

One notable exception was the federally funded Teenage Parent Welfare Demonstration (Aber et al. 1995), which found that a comprehensive welfare-to-work program for teenage parents (including education, job training, and/or employment requirements, in addition to child care, parenting supports, and case management assistance) was moderately effective in increasing the mothers' self-sufficiency activities, although it appeared to have little short-term effect on their economic well-being, parenting, or their children's development.

Other important policy areas include ensuring family leave after the birth or adoption of a child, ensuring the availability and quality of child care, and reducing the negative impact of divorce on children. Policies to reduce the negative impact of divorce may include mandatory mediation, parent education on the effects of divorce on children, and custody arrangements based on the best interests of the child. Even when the child's best interest is the statutory standard for custody decisions, such decisions are often uninformed by research or even clear delineation of important factors to consider when determining the best interests of the child (such as quality of the parent-child relationship, parenting skill, etc.). Clear statutory criteria that delineate these factors, based on the best available evidence, and appropriate judicial education in child-related research could improve the quality of child custody decisions (Kelly 1994).

A recent policy development in some communities is a requirement that parents whose children are found to have committed a juvenile offense

can be required to take a parenting skills class. Silverton, OR, reported a 44-percent reduction in juvenile crime after introducing such a law. It remains to be seen whether the law will continue to have an impact or whether this effect was primarily due to the normative impact of publicity about the law.

Another policy area important to family functioning is the funding of effective interventions, such as those described in this chapter, to assist families in the task of childrearing (e.g., home visiting programs of the families of newborns, other family support programs for at-risk families, parenting skills programs, mentoring programs). Limited public funds must be prioritized across the spectrum of social needs. The priority placed on public funding of effective family-focused interventions will determine, in part, their potential for broad dissemination.

Thus, researchers concerned with the prevalence of effective parenting practices must examine the effects of public policies on family functioning. An organizing question for policy research might be, "What impact will a given policy have on the prevalence of effective parenting or on factors that are known to influence effective parenting?" As areas where revised law or policy might influence families are identified, systematic research on the effects of proposed policies is needed. One type of study would simply correlate existing policy in different locations with the measures of family functioning. Hierarchical analyses might be able to tease out the impact of policy variability while controlling for other factors such as poverty.

Ultimately, however, researchers need experimental evaluations of the impact of policies. Unfortunately, there are only a few precedents for evaluating the effects of policy prior to its widespread adoption (Aber et al. 1995; Danziger and Weinberg 1986). Science could be a much more influential guide to policy development than it currently is in this area, but only if policymakers are held accountable for basing their policies on empirical evidence.

A COMMENT ON THE ETHICS OF INFLUENCING CHILDREARING PRACTICES

Adoption of the goal of influencing the prevalence of certain childrearing practices raises ethical issues. When family researchers conduct clinical research, each of the participants has the opportunity for informed

consent about the procedures that will be used and their likely impact on parents' and children's behavior. Presumably, nonresearch clinical interventions with families also provide for informed consent. However, research that focuses on changing the prevalence of parenting practices may involve interventions that do not present the opportunity for fully informed consent. For example, a media campaign to increase parental monitoring would be hard-pressed to obtain informed consent from each family that it reached.

It is important, therefore, to articulate guidelines that would minimize the risks to families and give populations that might be targeted in such research a voice in what happens. The issue has been discussed in some detail by Kelly (1988), Fawcett (1990), and Biglan (1995). Perhaps the single most important dictum is that researchers should forge a collaborative relationship with representatives of the communities involved in the research. Fawcett (1990) has advocated that the goals and methods of the research be appropriate to the goals and needs of the community, that interventions be designed to be replicable by other communities, that the results of research be openly communicated to those who are its intended beneficiaries, and that research should benefit people of marginal status by empowering them.

The communication of research findings bears further comment. Family researchers have an ethical responsibility to articulate research findings about beneficial parenting practices and family interventions. At the same time, existing evidence is limited about the extent to which research findings are replicable across different cultural or ethnic groups. These limitations must also be communicated. As Fawcett (1990) has advocated, the ultimate decision about whether to promote a particular parenting practice or family intervention in a given community should be in the hands of representatives of that community. However, the community will be served best if its members have a clear summary of what practices and programs have been found to be of value in other communities.

ADVOCACY

The tobacco control movement has one more lesson for those who are trying to enhance family functioning: Simply articulating the empirical evidence about the costs and benefits of a cultural practice can affect that practice. Warner (1977, 1989) concluded that the issuance of the 1964

Surgeon General's report on the carcinogenic effects of smoking led to a downturn in the prevalence of smoking. As the tobacco control community has become more aware of the potential to improve health practices through advocacy, advocacy efforts have become more extensive and sophisticated (Wallack et al. 1993). For example, the compilation of the evidence on the effects of passive smoking in the 1993 Surgeon General's report was intended to provide widespread publicity for evidence of the harm of passive smoke. The report and the publicity that the report generated influenced organizations around the Nation to push for greater control on smoking in places where others would be exposed.

The Center for Substance Abuse Prevention is playing an important role in articulating what is known relevant to preventing substance abuse. The Prevention Enhancement Protocol System project is systematically reviewing the evidence in specific areas and articulating what State and local agencies can do, in light of that evidence, to more effectively prevent substance abuse.

Nonetheless, there is a role for the National Institute on Drug Abuse (NIDA). In the area of family functioning, NIDA should have a strategic plan that indicates (1) the kinds of family practices and organizational practices and policies that need to change if the Nation is going to reduce the prevalence of substance abuse and other problems of youth and (2) the kinds of practices that will promote successful youth development.

A system of media has developed in this country that brings news of health-related research directly to everyone. For example, the public's knowledge of the value of low-fat diets has been widely reported. A pronouncement from the National Cancer Institute (NCI) regarding the benefit or harm of a practice is immediately and widely reported. Take, for example, the issue of whether women between the ages of 40 and 50 should have mammograms. In 1993 NCI withdrew its support for the consensus guidelines, which recommended that women ages 40 to 49 have a mammogram every 1 to 2 years. NCI did so because it concluded that the evidence was not clear that mammography among women in this age range would save lives. The issue was hotly debated ("NCI drops . . ." 1993), because it was generally understood that the Institute's position would influence whether physicians recommended mammography and whether women sought them.

There is no reason why NIDA could not similarly articulate the implications of well-established findings for policy and practice. In some cases, the pronouncement would need to be made jointly by several institutes, such as NIDA and the National Institute of Mental Health and the National Institute of Child Health and Human Development. An NIH consensus conference is an appropriate vehicle for arriving at such statements.

The value of parental monitoring is one area in which it may be time to articulate a consensus about the evidence. Other chapters in this monograph review the evidence that parental monitoring influences young people's associations with deviant peers and their engagement in diverse problem behaviors (Dishion et al. 1996). It should be possible to state the importance of this parenting practice and the ways in which monitoring might be encouraged or supplemented. A clear statement about monitoring could influence the practices of many parents and influence schools and communities to develop policies and practices that encourage monitoring.

EXPANDING THE AGENDA FOR RESEARCH ON FAMILY-FOCUSED INTERVENTIONS

Imagine a society in which well-validated family-focused interventions (e.g., Henggeler et al. 1986; Olds and Pettitt 1996; Szapocznik 1996; Webster-Stratton 1981*a, b*, 1982*a, b*, 1984; Webster-Stratton et al. 1988, 1989) were widely available. Suppose that most families were frequently exposed to media that promoted effective family practices. What if schools systematically identified children who were at risk for the development of problem behaviors and ensured that they and their families received the programs that would reduce their risk? Suppose that research identified optimal approaches to supervised recreation that increased the likelihood that at-risk children developed prosocial competencies and positive relationships with prosocial peers. Communities could develop mentoring programs (e.g., Davidson and Basta 1989) that reduce recidivism among offenders.

Communities that develop all of these practices are more likely to have a high prevalence of effective parents and a low prevalence of youth who engage in serious problem behavior.

How likely is it that society will achieve such cultural practices? That is unclear. But society is more likely to do so if family researchers expand

their agenda to explore all of the ways in which the prevalence of effective childrearing practices can be increased. The specific lines of research that need to be pursued include the following:

- Experimental research evaluating methods of increasing at-risk families' participation in parenting skills training programs
- Systematic research on the dissemination of validated family interventions
- Analysis of the characteristics of organizations that are associated with the adoption and maintenance of validated family interventions
- Analysis of the consequences that influence organizations to provide validated family interventions
- Experimental evaluations of programs to influence organizations to adopt and maintain validated family interventions
- Systematic research on nonclinical means of influencing parenting practices
  - Experimental evaluations of media interventions to influence parenting practices
  - Development and experimental tests of school-based interventions to affect parenting practices
- Research on how communities might supplement parental childrearing efforts
  - Experimental evaluations of the efficacy of supervised recreation in reducing youth problem behaviors
  - Further development and evaluation of mentoring programs
- Systematic research on the influence of policies regarding parenting practices and child outcomes

NIDA and other institutes that are concerned with childrearing practices should also become better organized to advocate for better childrearing practices. They should articulate what is already known about effective

childrearing practices and should organize to influence both policymakers and parents to adopt "best practices." Such advocacy is well within the public health mission of the institutes. It would focus the efforts of millions of Americans who are very concerned about the problem behaviors of youth, but who lack information about what are more and less useful strategies for addressing these concerns.

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AUTHORS

Anthony Biglan, Ph.D.
Research Scientist

Carol W. Metzler, Ph.D.
Research Scientist

Oregon Research Institute
1715 Franklin Boulevard
Eugene, OR 97403-1983

Family-Focused Prevention Intervention Research: A Pragmatic Perspective on Issues and Future Directions

Richard L. Spoth

INTRODUCTION

The primary objective of this chapter is to provide a pragmatic perspective on family-focused prevention intervention research issues and strategies. This pragmatic perspective focuses on the ultimate utility of research, particularly its impact on family functioning and child problem behaviors in various segments of the population. Such a perspective is consistent with standards articulated by pragmatists who propose that the most meaningful ideas are those that yield the most practically useful results (e.g., James 1909). Fortunately, advances in prevention science models and methods have greatly enhanced the practical benefits of family-focused prevention intervention research. These advances include consumer research on family participation factors, contextualist or ecological approaches to research partnerships, methods for the study of intervention-related change mechanisms, and the adaptation of research dissemination guidelines from preventive medicine.

A large number of family-focused prevention intervention research issues carry practical implications, either directly or indirectly (see Center for Substance Abuse Prevention [CSAP] 1995*b*; Small 1990; U.S. Department of Justice 1992). A major issue confronting researchers is the need for a conceptual framework to guide the design, implementation, evaluation, and field application of family interventions, as discussed in the next section.

A HIERARCHY OF RESEARCH FUNCTIONS AND ISSUES

Extant prevention research models, such as the Institute of Medicine (IOM) Preventive Intervention Research Cycle (Institute of Medicine 1994) and the National Cancer Institute (NCI) five-phase model for

intervention research (Greenwald and Cullen 1985) are oriented toward the goal of translating sound research into practice. Consistent with the IOM and NCI research models, a fundamental requirement for sound family-focused prevention intervention research is the conceptualization of guiding theories or hypotheses, starting with a clear definition of key terms and concepts. As Lewin stated, there is nothing more practical than good theory; precise and consistent definition of key terms and concepts is essential in reaping the practical benefits of good theory and the research testing that theory (Lewin 1951).

Another fundamental research activity involves the development of methods that maximize experimental validity and sensitivity. Though often challenging in the context of intervention research, application of optimal research methods is ultimately practical because it greatly enhances the researcher's ability to draw reasonable conclusions from empirical studies that are useful to practitioners. Corresponding to the middle phases of the IOM and NCI models, this empirical study function should include intervention needs assessments, appropriate collaboration with interested parties in implementation localities, and effective intervention recruitment and retention strategies. Addressing intervention research implementation issues in an ecologically sound way (see Lerner 1994) reduces the difficulties of working through issues associated with the final, ultimately practical researcher function, namely, facilitating the application of research findings. This function includes field implementation of efficacious interventions, the conduct of studies to guide policymaking (e.g., cost-effectiveness evaluations), and communication of findings to policymakers.

All of the aforementioned research functions are aided by a strong research infrastructure (e.g., strong organizational mechanisms for research collaboration) and a clear research agenda. Optimally, this agenda is formulated in light of the needs of at-risk children and families of all races and all socioeconomic strata. This approach is challenging, primarily because the amount of family-focused prevention intervention research needed to address the wide-ranging needs of at-risk children and families far exceeds the resources available to conduct it. The magnitude of substance-related problems among American youth (Carnegie Council on Adolescent Development 1995; Center for Substance Abuse Prevention 1995*b*; Johnston et al. 1994; U.S. Department of Health and Human Services 1994) and the costs associated with implementation of intervention research models like those proposed by IOM magnify this gap between the research work

needed and the available resources. Given this state of affairs, setting research priorities sensitive to the needs of children at risk for substance problems is critically important.

Small (1990) has addressed the importance of the practical implications of family intervention research by framing this research in terms of hierarchically arranged functions of parenting related to children's needs, similar to Maslow's (1970) hierarchy of individual needs. The foundation of this hierarchy of parental functions is the provision of the basic needs of children; farther up the hierarchy are children's needs for nurturance and guidance. Capping the hierarchy is the need for advocacy and support in the context of the broader community. This framework has been used to present recommendations for practitioner implementation of family interventions (focusing on families with adolescents) and for family intervention research.

Small's (1990) presentation of parenting functions suggests that the community of researchers should consider the hierarchy of children's needs and related parental functioning if their research is to have optimal practical benefits. For example, teaching parents child management skills is not likely to be effective if those parents are struggling to meet the family's basic survival needs. Optimally, such needs are considered in (1) establishing a research agenda by the research community, (2) individual researchers' decisions about the implementation of prevention intervention research studies, (3) the dissemination of best practice information, and (4) the communication of findings to policymakers.

A framework of research functions and associated issues in family-focused prevention intervention research is outlined in figure 1. Consistent with the IOM research model (Institute of Medicine 1994), this framework indicates that progress in addressing tasks and issues in the development of theory and methods facilitates intervention implementation and application of intervention research findings (discussed in the next section). Likewise, knowledge gained from intervention implementation and application of findings can inform refinement of theory and methods. This process is represented by the feedback loops in figure 1.

The remainder of this chapter discusses the research issues and needs outlined in table 1. These parallel the research activities and functions

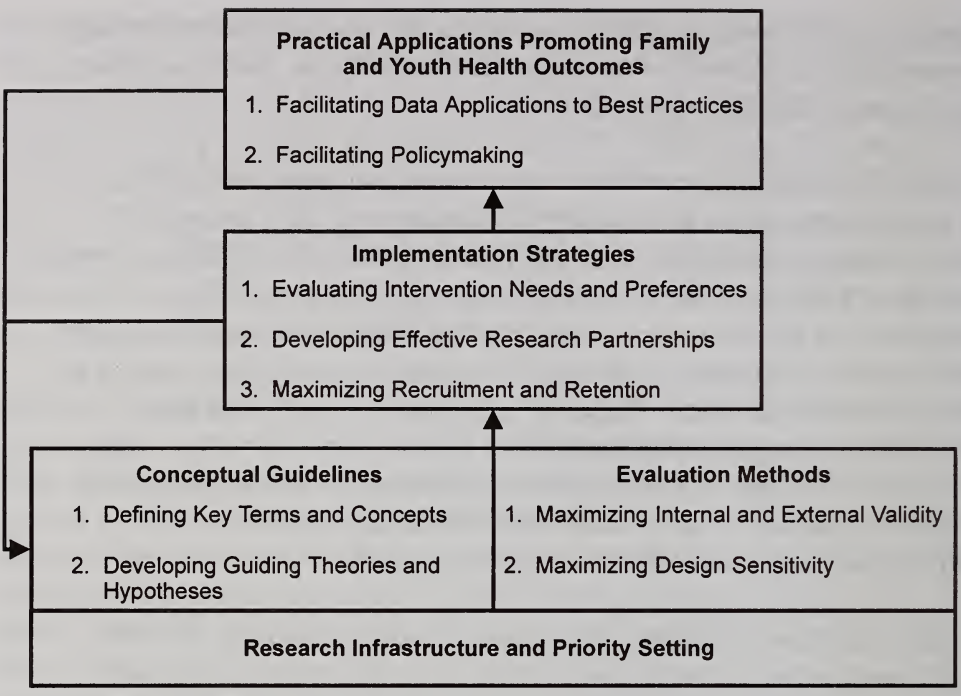

FIGURE 1. *A framework for articulating family-focused prevention intervention research issues: Issues associated with researcher activities and functions supporting applications to practice.*

presented in figure 1, an overview of issues and needs specific to each research function. One or two key issues are then discussed in greater depth, and illustrations of how these issues have previously been addressed are provided, drawing on work from a large-scale research project on family-focused prevention interventions. Finally, fundamental issues concerning research priorities and infrastructure are discussed.

CONCEPTUAL AND THEORETICAL GUIDELINES

Definition of Key Terms and Concepts

It will be difficult for the field of intervention research to progress and achieve its practical objectives if ambiguities and inconsistencies in the key terms and concepts abound. Definitional stumbling blocks are especially problematic when they are integral to the guiding hypotheses and theories that are influential in the field. They are also problematic

TABLE 1. *Issues and needs in research on family-focused prevention interventions.*

Primary Types of Researcher Functions	Key Tasks	Selected Issues and Needs
Developing conceptual/ theoretical guidelines	1. Clearly defining key terms and concepts	a. Address varying definitions of family b. Develop consensus definition of prevention research and prevention intervention c. Address ambiguities in definition of intervention typologies (e.g., universal, selective, indicated)
	2. Developing guiding theories and hypotheses	a. Develop generalizable etiological models across programs of research b. Develop "small" theory to guide intervention design, addressing limited specificity of etiological models
Developing evaluation methods	1. Maximizing experimental validity	a. Conduct more studies with strong internal and external validity b. Improve standardization of measures across studies and extend use of multimethod, multiagent approaches
	2. Maximizing design sensitivity	a. Use larger sample sizes and measure intervention integrity, especially in studies of interventions of modest intensity b. Apply "sensitive" design approaches, including latent variable structural methods
Strengthening the foundation	1. Addressing ethical/moral issues	a. Address general challenges to human rights protection b. Set priorities that carefully consider family needs
	2. Developing infrastructure	Strengthen support for research infrastructure and coordination

TABLE 1. *Issues and needs in research on family-focused prevention interventions (continued).*

Primary Types of Researcher Functions	Key Tasks	Selected Issues and Needs
Designing implementation/ engagement strategies	1. Orienting interventions toward demonstrated needs and preferences	a. Assess family needs when planning interventions b. Apply consumer research to identify population segments, determine family preferences, and improve intervention acceptability
	2. Developing effective research partnerships	Develop more optimal models and methods of collaboration with stakeholders
	3. Maximizing recruitment and retention rates	a. Increase study of sociodemographic, prevention belief, and social influence factors affecting family participation b. Conduct more study of optimal strategies to overcome recruitment/retention barriers, particularly with universal interventions
	4. Addressing cultural sensitivity	Devote more attention to cultural sensitivity and study with "special" populations
Facilitating research applications	1. Facilitating data applications to best practices	Develop appropriate guidelines for practitioner applications, taking into account limited data
	2. Facilitating policymaking	a. Appropriately inform policymakers b. Conduct research to guide policymaking (e.g., cost-effectiveness of interventions)

when they bear on the clarity of boundaries defining the field itself (e.g., the concept of prevention intervention). In formulating directions for family-focused prevention intervention research, clear specification of key concepts is warranted. The fact that many of the relevant concepts (e.g., family, prevention research, prevention intervention) are inconsistently defined in various literatures presents a number of challenges. These include impediments to the development of a focused research agenda, difficulties in precise comparisons of findings across studies, and barriers to cumulative knowledge building. The chapter appendix summarizes inconsistencies in the usage of several key terms (family; prevention research; prevention intervention; and universal, selective, and indicated interventions) and notes several implications of inconsistent usage.

Guiding Theories and Hypotheses

Before an intervention is developed, the Institute of Medicine (1994) prevention intervention research model recommends that a theoretical model be carefully chosen to guide the design of the intervention. Considering strategies for choosing theoretical models for family-oriented prevention intervention raises a number of issues. These issues focus on the practical matter of applying etiological research to the design of an intervention targeting a particular population.

Dishion and colleagues have noted how important it is to conceptualize family processes in a manner that maximizes the practical utility of the research findings (Dishion et al. 1988) and how helpful it can be to use a small number of interrelated concepts in this conceptualization (Patterson et al. 1992). These points are well illustrated in their programmatic research, with its underpinnings in a long tradition of well-integrated clinical, theoretical, and empirical work. However, beyond some exemplary, long-standing programs of research, the field as a whole confronts a number of challenges in "integrating" theory, basic investigation, and applied investigation originating in different disciplines and/or programs of research.

Among key challenges are verification of the generalizability of the etiological findings with one population to another population, even when there are only minimal sociodemographic differences, and determination of how the state of the etiological art can best be applied to intervention research with understudied special populations. As an example of the problem of generalizability, the degree to which

etiological models developed on a specific white, urban, and middle-class population (e.g., in New York City) generalize to the design of the intervention for another white, urban, middle-class population (e.g., in Atlanta, Georgia) is important to consider, because of the potential intervention-relevant differences among such populations (e.g., religious beliefs, cultural influences) despite some similar sociodemographic characteristics. Similarly, findings from one type of special population (e.g., economically stressed rural families in Iowa) may not generalize to a similar special population in a different part of the country (e.g., Virginia) supported by a different type of economic base (see Spoth 1997). Obviously more problematic is the generalizability of models tested with white, urban, middle-class populations to minority, lower income, or rural populations. There has been very limited analysis of family etiological models with special populations (e.g., minority, rural, lower income) applied to intervention research (see Small 1990; Spoth 1997), even though it is urgently needed.

Reid (1991) underscores the point that many of the challenges in the application of etiological models to prevention intervention design occur because of "deficits and gaps in the basic knowledge base" (p. 868). In designing interventions, researchers must often rely on the integration of findings from multiple studies on the causal processes linking risk factors to deleterious outcomes of interest. A number of problems often arise in this integrative scholarship as a result of the deficits and gaps in the etiological knowledge base. Individual studies rarely include a comprehensive set of etiological variables of relevance to the design of an intervention; evaluating the relevance of these variables across studies is difficult because both etiological and outcome variables are often measured in various ways. Because there is so little longitudinal research on comprehensive sets of etiological variables linked with specific outcomes, there is frequently a dearth of knowledge about (1) whether or not various individual etiological variables evaluated across multiple studies indicate distinct causal processes, (2) what the actual sequencing of etiological effects is, and (3) which among the variables account for most of the variance in the outcome(s) of interest. Reid (1991) illustrates these points in his discussion of research on the etiological factors associated with poor outcomes among children for divorced families (e.g., deteriorations in the custodial parent-child relationship and problems with child discipline—also see Pillow et al. 1991).

Several other issues can arise in the application of etiological models to guide practical intervention design. Another obvious one is that the constructs in etiological models are often defined at a more molar level than is useful for interventions operating at a more molecular level. Etiological models often specify global constructs (e.g., quality of parenting) that only loosely correspond to the specific behaviors targeted by an intervention (e.g., specific skills-training techniques intended to change specific types of behaviors or sets of behaviors—such as those involving parental monitoring, disciplinary, and communication techniques—in specific contexts). In addition, these global etiological models may include nonmodifiable factors. Moreover, global models do not specify behavior and attitude change techniques required to modify the individual causal factors in the model, or the degree to which they must be adapted to culturally based expectations, learning styles, and other characteristics of intervention participants. Many of the etiological models in the literature account for only a relatively limited amount of variation in the targeted outcome. A model having a good fit to the data and including quality of parenting as well as other nonmodifiable contextual (e.g., socioeconomic) factors may account for 30 percent or less of the total variation in child outcomes of interest (e.g., young adolescent substance use). (Also see Institute of Medicine [1994] for a discussion of related issues concerning the application of etiological models to intervention design.)

Some of the above points became especially salient in a search of the etiological literature for guidance in the adaptation of existing family-focused prevention interventions to lower income rural midwestern populations. The goal was to intervene in specific types of parent and young adolescent behaviors causally related to the young adolescent outcomes of interest. The author and his colleagues were also interested in finding models of the mechanisms whereby etiological factors operated on the specific outcomes of interest, at a level of specificity that could be helpful in intervention design (e.g., effects of specific types of communication between parents and teachers on problem behaviors observed in the classroom setting). Finally, the author and his colleagues were especially interested in etiological models addressing protective or resiliency processes.

Although many excellent studies on family-related etiological processes were found, most of this research had the threefold problem of inconsistent measurement of causal variables, unknown generalization to the target population, and a lack of specificity necessary to guide

intervention design. The most relevant, high-quality etiological research was conducted by colleagues in the author's research center with local populations (e.g., Conger and Elder 1994). This research allowed for a level of confidence that targeting parenting skills-training would be helpful in the reduction of young adolescent problem behaviors in the population, but did not provide guidelines on how to change the causal variables in question—that is, how to design such training within acceptable parameters (e.g., appropriate and acceptable skills-training techniques, time demands on participants) in the population of interest. By necessity, the alternative to "a theoretical model to guide the intervention" (see Institute of Medicine [1994], pp. 365-366) was a process of synthesizing a practical theory. That is, researchers drew upon a synthesis of clinical experience with the population, relevant intervention research, and relevant etiological research to bridge the gap between the general knowledge base and the particular intervention design needed. The next section illustrates how data from family-focused intervention research studies can be used to address related gaps between the knowledge base and the specifics of an intervention design for a given population.

Another way of thinking about the issue of applying molar etiological models to molecular intervention design is presented by evaluation theorists. The limitations in applying the extant etiological literature to the specific requirements of family-focused prevention intervention design, particularly with special populations, highlight a fundamental distinction between etiological and intervention models frequently noted in the evaluation research literature (e.g., Chen and Rossi 1983, 1987; Lipsey 1990; Rossi and Freeman 1992). These theorists describe how etiological theory emphasizes the natural causes of a problem, while intervention theory emphasizes the mechanisms through which the intervention can affect the problem. An important point is that the processes naturally producing the problem may differ from those remedying it—an intervention may not result in the same behavioral or social processes that result when the changes occur naturally (see Rossi and Freeman 1992 for illustrations of this point). As Lipsey (1990) notes, etiology involves "large" or "grand" theory about general biological, sociological, or psychological phenomena; intervention theory is "small" theory focusing on the explanation of processes specific to one type of intervention. Small theories are more practical in that they focus on the impact of change procedures on specific mechanisms of change. Improving the understanding of such mechanisms is critically important for intervention refinement. These

mechanisms of change involve, for example, links in the sequence of intervention-related change in specific types of social interactions, and the influence of individual difference variables on those changes. It is especially clear that there is a need for the development of small theory to guide the design and refinement of interventions targeting special populations. The practical theory referenced in the preceding paragraph was, essentially, a specific small theory focusing on the target population.

Small-theory development is facilitated by intervention designs that initially utilize a combination of (1) etiological theory, (2) relevant intervention research, and (3) clinical experience, subsequently using experimental data to clarify and refine models of intervention-related change mechanisms. In turn, small-theory development serves the ultimate, practical goal of the development of efficacious interventions for application to specific populations. There are several prevention intervention research programs that illustrate this type of approach to intervention development, particularly those concerning indicated prevention interventions for conduct problems (e.g., Conduct Disorders Prevention Research Group 1992; Patterson et al. 1992).

This type of programmatic research approach often begins with an attempt to define the problem targeted by an intervention in terms of incompetent or inappropriate responses to environmental demands and to clarify what constitutes competent responses or appropriate skills, guided by relevant research and theory. Once the desired competencies or skills are selected for intervention purposes, the competency or skill-learning process is conceptualized. Intervention content and delivery or competency training strategies can then be designed. At this point, the characteristics of diverse situations in which the competencies must be applied, individual differences in learning the targeted competencies, and contextual or cultural factors that could influence competency acquisition must be considered. Intervention design also includes integration of contextual supports for competency acquisition. In the case of young adolescent problemsolving competence, for example, the intervention might include methods of support and reinforcement from parents, teachers, and peers. Finally, methods for appropriately structuring the learning environment are considered, including appropriate training for those implementing the intervention and, if the intervention has a small-group format, appropriate group composition. An illustration of the implementation of this type of intervention design process has been reported by Bierman (1994, 1995).

Illustrative Conceptualizations of Intervention-Related Change Mechanisms

Because of the careful, practically oriented conceptualization involved, interventions that have been based on models such as the one in the previous paragraph readily lend themselves to modeling of intervention-related change mechanisms using data from outcome studies. Family-focused prevention interventions tested at the author's research center were selected for evaluation, in part, because of the strong empirical and theoretical basis of their design; several approaches to the examination of change mechanisms associated with these interventions are currently being assessed. This work is being conducted through programmatic research under the title "Project Family" (Spoth and Redmond, submitted, 1995*b*, 1996*a*).

Project Family is a series of investigations addressing (1) the efficacy of universal family competency training interventions and mechanisms of intervention-related change, (2) factors influencing family participation in these interventions, and (3) the prevalence of protective and risk factors indicating the need for family-focused prevention services. Achieving the goal of investigating the efficacy of family competency training interventions and intervention-related change mechanisms has involved addressing two sets of complementary research questions. The first question entails conventional tests of intervention effects on targeted outcomes. For example, one of the interventions under investigation is the Preparing for the Drug-Free Years (PDFY) Program (Hawkins et al. 1988, 1991). A previous report summarized the positive outcomes of global measures of parenting (e.g., parent-child affective quality and effective child management), using analyses of covariance (Spoth and Redmond, submitted, 1995*b*). In addition, the results of analysis of covariance tests of more specific measures of outcomes targeted by specific sessions have also been generally positive, but relatively more mixed than results concerning global parenting outcomes, both on self-report (Kosterman et al., submitted, 1995*a*) and observational measures (Kosterman et al., submitted, 1995*b*).

A second, but complementary, type of research question addressed by Project Family focuses more directly on intervention-related change mechanisms. Essentially, the relevant question addressed is, How do naturally occurring etiological processes combine with intervention processes to produce changes in selected dependent variables? Various types of path modeling have been used to examine effects hypothesized

to be central to these two processes, including additive or direct effects, indirect or mediated effects, and moderating effects. To date, most of these path models have concerned the evaluation of additive direct and indirect effects, focusing on family-related protective etiological processes wherein intervention parameters have played a significant but secondary role (e.g., Spoth and Redmond 1996*b*; Spoth et al. 1996*d*).

The conceptual and path analytic strategies used to examine change mechanisms in Project Family illustrate a rich variety of options. Essentially, in each case, the role of intervention variables (e.g., dummy code based on group assignment, intervention dosage) is considered in light of the presumed causal relationships among the change mechanism variables involved. Conceptually, these models have begun with careful consideration of (1) the theoretical and empirical work bearing on etiological processes in producing specific outcomes of interest, (2) the expected role of the intervention in this context, and (3) the appropriate data analytic methods for examining the types of etiological and intervention effects that are expected.

As an example, regression analyses have also been used in a path analytic framework to examine (1) the effects of individual difference variables (parent readiness for change and parent self-efficacy) and attendance in the PDFY intervention on parenting behaviors directly targeted by the intervention, after controlling for pretest levels of intervention-targeted parenting behaviors, and (2) the indirect effects of individual difference and PDFY intervention attendance on general child management skills (via effects of intervention-targeted parenting behaviors). The mechanism of parenting change posited in this path analytic framework assumes that the PDFY intervention has its strongest effects on the parenting behaviors it was specifically targeted to change (e.g., clarifying rules regarding child substance use) and that changes in those targeted behaviors would promote changes in related, more general parenting practices (e.g., setting standards concerning a range of child behaviors). Regression analysis results showed individual difference effects on intervention-targeted parenting behaviors and generally supported the assumed mechanism of parenting change, as illustrated in figure 2.

In addition to regression analysis results summarized in figure 2, analyses were conducted to examine whether a model with interaction effects contributed significantly more than regression models containing

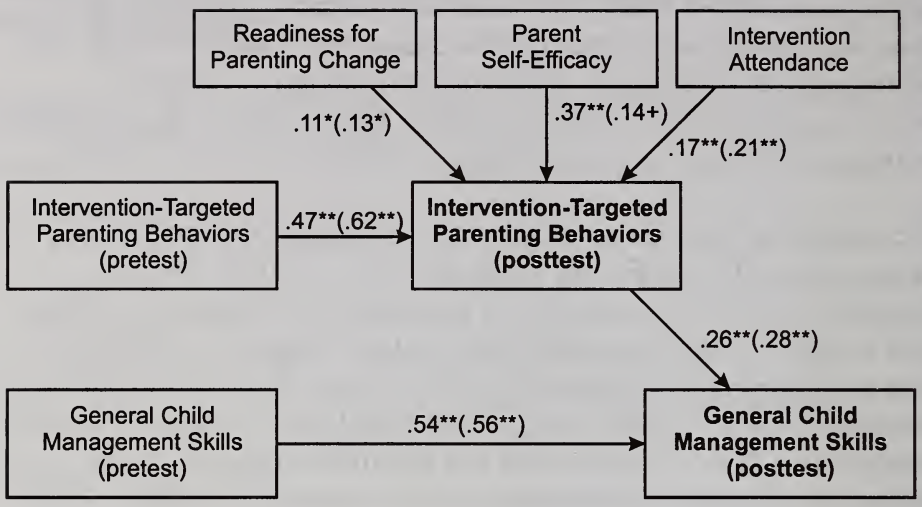

FIGURE 2. *Path model illustrating test of intervention-related change factors on proximal parenting behaviors.*

NOTE: Standardized regression coefficients for mothers are outside the parentheses; coefficients for fathers are inside parentheses (+: $p < 0.10$; *$p < 0.05$; **$p < 0.01$).

SOURCE: Summarized results from table data by Spoth et al. 1995*c*.

main effects only. Subsequently, assessments of which specific interaction terms were significantly contributing to an increase in predictive power were conducted. In these regression analyses, the intervention condition was dummy-coded (see Spoth et al. 1995*c*).

Other path models tested in Project Family have incorporated child outcomes. These child outcomes are hypothesized to be relatively distal to parenting processes directly and immediately influenced by the intervention (i.e., those measured at posttest, such as child management practices). In these cases, intervention parameters (e.g., session attendance) have been incorporated to account for indirect intervention effects expected to be small in size (e.g., Spoth et al. 1996*c, f*).

In sum, this discussion of path-analytic approaches to modeling intervention-related change mechanisms illustrates that the manner in which intervention effects are modeled depends on the researcher's

objectives and assumptions about the role of the intervention in any given case. In particular, family-related etiological processes specific to the outcome of interest and the points at which the intervention would likely impact that process need to be carefully considered.

STRENGTHENING METHODS FOR INTERVENTION EVALUATION

It is helpful to compare current investigations of family-focused preventive interventions against standards for experimental research. The most striking result of such a comparison is that there has been very limited family-focused research conducted to date that meets the criteria for strong validity in experimental design (internal, external, construct, and statistical conclusion validity; see Cook and Campbell 1979). In addition, most of the extant research has very limited "design sensitivity" (see Lipsey 1990), which also includes consideration of construct and statistical validity issues.

In short, there are a limited number of indicated and selective family-focused prevention intervention studies that demonstrate any appreciable degree of validity and sensitivity; no published reports of controlled universal family-focused intervention studies with multimethod measurement could be found outside of the author's research center. As previously reported, family-focused interventions are widely disseminated, but rarely evaluated, in any form (Small 1990; Spoth 1997). A comprehensive review of the literature for the CSAP (Center for Substance Abuse Prevention 1995*b*) guideline on family-oriented interventions showed that those that are evaluated are primarily indicated interventions. This CSAP review and several others (e.g., Chatterji et al., this volume; Small 1990; U.S. Department of Justice 1992; Wiese 1992; Yoshikawa 1994) clearly demonstrate that the few evaluation research studies that have been conducted suffer from a number of deficits limiting their validity, sensitivity, and practical implications, including a lack of a strong theoretical and empirical base, small sample sizes, a lack of experimental control, a lack of followup assessments, problems with assessment by intervention interactions, a lack of statistical control, a failure to evaluate intervention fidelity, and limited cost-effectiveness evaluation. Some of these deficits (e.g., sample size, fidelity evaluation) are especially problematic in the typical case where only small to moderate effect sizes are expected.

Reviews also show that there is limited use of multimethod, multi-informant measurement procedures, despite the ample literature on the benefits of these procedures in research with families (e.g., Bank et al. 1990; Conger and Elder 1994; Hops et al. 1987; Lewin et al. 1993; Patterson et al. 1992). Additionally, there has been a great deal of variability in the operationalization of constructs with similar labels (e.g., Hoppe et al. 1993; Spoth and Redmond 1996*a*). Moreover, there has been limited application of graphical and data analytic strategies that are advantageous in addressing problems associated with (1) missing data and subject attrition, (2) the analysis of change in dynamic outcome variables, and (3) curvilinear relationships between variables (see Collins and Horn 1991; Collins and Shanahan 1996; Duncan and Duncan 1995; Graham et al. 1994; Hawkins et al., submitted, 1996; Spoth et al. 1997*b*). Finally, problems associated with nested designs and multilevel data structures frequently are not adequately treated (Collins and Shanahan 1996; Dwyer et al. 1989; Murray and Hannan 1990).

The significance of the problems noted in the paragraphs above comes into clearer focus when viewed from the perspective of the IOM research model. According to this model, any given intervention requires a series of valid and sensitive studies before it is appropriate for widespread application. Although in its early stages, Project Family has addressed a number of issues among those described earlier. In addition to employing subject selection procedures and experimental designs strengthening internal and external validity, a number of methods have been employed in Project Family to address issues related to design sensitivity. For example, methods used to determine appropriate sample sizes for achieving given levels of statistical power in the case of substance onset measures have been critically evaluated, leading to recommendations for the application of conditional binomial methods to control for baseline rates, other than in the case where those rates are quite small (Yoo and Spoth 1993). As another example, an observational system designed to ensure implementation integrity has been developed. In the context of this chapter, the focus is on sensitivity and validity enhancement methods employed in Project Family to assess outcomes through the use of a latent variable approach.

Latent Variable Approaches Addressing Validity and Sensitivity

As Aiken and colleagues (1994) reported, structural equation modeling (SEM) can be effectively applied to treatment outcome research. SEM

analyses are analogs of classical multivariate techniques (e.g., multiple analyses of covariance [MANCOVAs]) and can simultaneously address a combination of measurement and data analytic problems that limit experimental validity and sensitivity. They can also directly contribute to theoretical model development. There are several potential advantages of incorporating SEM in family-focused prevention intervention outcome research.

First, SEM can assist in the reduction of the effects of both random measurement errors and measurement method biases that threaten the power to detect mean differences in comparing groups on dependent or outcome measures (e.g., Russell et al., submitted, 1995). Given the small effect sizes that can often be expected as a result of prevention interventions (particularly low-intensity interventions with general populations), this is a particularly important advantage to consider in analyzing data from prevention studies. Second, SEM facilitates the examination of intervention-related change mechanisms, complementing conventional tests of intervention effects on selected outcome measures (Spoth et al. 1995*c*). It can be used to examine theory-based mediators of intervention-related influences on outcomes like those discussed in the preceding section. The indirect effects of variables proximally influenced by the intervention on relatively more distal outcomes can be assessed.

A third important advantage of SEM is that it allows assessment of intervention effects on a number of outcomes simultaneously (Aiken et al. 1994). This is especially noteworthy in the context of family-focused prevention intervention research, since interventions in this area are complex, with multiple intervention goals. Essentially, SEM puts the researcher in a better position to examine an expected set of multiple intervention effects on constructs with multiple indicators. (See Aiken et al. 1994 for an examination of tradeoffs in the application of MANCOVA versus SEM analyses.)

Fourth, SEM can be applied to problems with missing cases and missing data. As illustrated by Aiken and colleagues (1994), SEM can be used to assess the effects of attrition on intervention outcomes. Given the fact that attrition is a common problem in family-focused intervention research (Spoth and Redmond 1994), this benefit is an especially key one. In addition, SEM can be used to compare participants with complete data and those with partial data, using information available on both groups (Russell et al., submitted, 1995). Furthermore, differences

in relations among variables in the two groups can be examined using multiple-group SEM analyses.

A final point is that, for a variety of reasons, family intervention studies are often quasi-experimental. With this type of design it is especially important to examine differential selection biases. In such cases, a group-coded strategy in the application of SEM can be employed in which, when appropriate, experimental condition is used as a categorical predictor and pretest levels on latent constructs are controlled (see Aiken et al. 1994).

Two sets of SEM analyses conducted in the context of Project Family efficacy studies illustrate the validity and sensitivity benefits described earlier. The two sets of analyses involve two outcome studies, both of which used random assignment to condition and were designed to test the efficacy of the PDFY family competency-training intervention referenced in the prior section. Study procedures and the measures used in the analyses outlined below have been previously described in detail (Spoth and Redmond 1996*a*; Spoth et al. 1995*c*).

The first set of analyses was conducted to illustrate some of the advantages and issues associated with latent variable SEM (Russell et al., submitted, 1995). For example, the findings illustrate how estimates of intervention effects and of the stability of constructs over time are altered when a latent variable SEM approach is utilized. The upper portion of figure 3 displays the results of regression analysis, controlling for the pretest measure of the outcome (targeted parenting behaviors). It shows that the intervention was a significant predictor of the outcome, using a dummy-coded variable reflecting group membership. For illustrative purposes, factor analyses of the items composing the targeted parenting behaviors measure guided the identification of three indicator variables (I_1, I_2, I_3) that were used to specify a latent variable at pretest and at posttest. The bottom portion of figure 3 illustrates the use of SEM to derive estimates of relations among the constructs that are unaffected by random measurement error. Employing this latent variable approach, the estimated stability of the construct increases from 0.65 to 0.90 (test to retest standardized path coefficient) and the estimated effect of the intervention increases from 0.20 to 0.25. Further analyses that incorporated correlated measurement error and constrained the loadings of the indicator variables at posttest to be equivalent to those at pretest (to ensure that the nature of the measured construct did not change) improved the model fit and

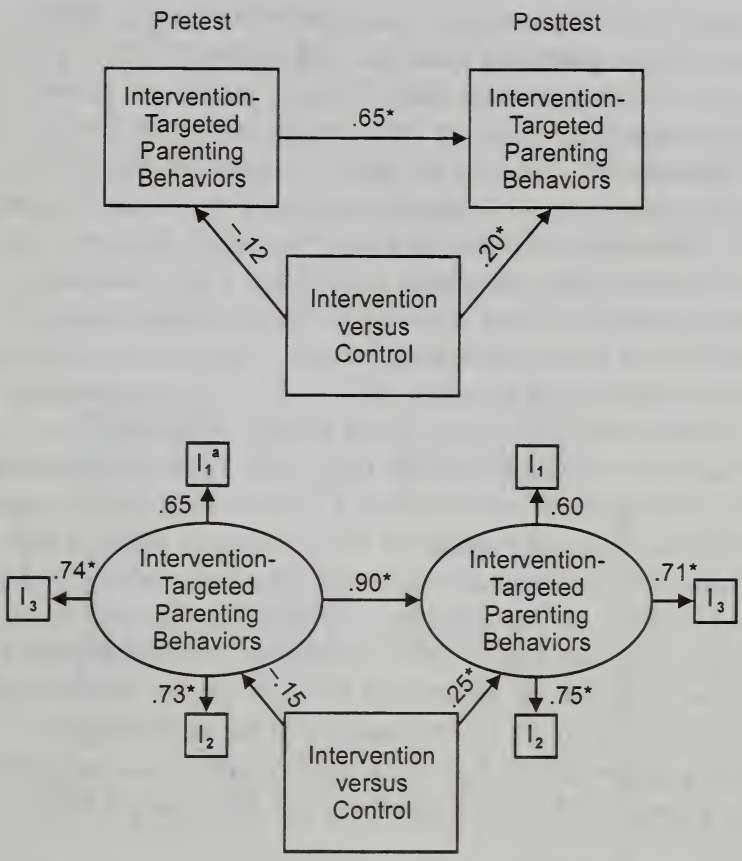

FIGURE 3. *Illustration of improvement in the estimated intervention effect when using a latent variable approach.*

$^{*}p < 0.05$

KEY: ^{a}I = indicator scale for latent variable

showed a significant relationship between the intervention and the outcome (Russell et al., submitted, 1995).

The second set of illustrative SEM analyses entailed the application of a latent variable strategy to the examination of the direct and indirect effects of three parent competency outcomes following the PDFY competency-training intervention trial (Spoth et al. 1996*c*). This approach illustrated the benefits of using SEM to simultaneously evaluate multiple outcomes of the intervention when controlling for pretest levels of those outcome variables. Based on a pilot study intervention effects model and related findings (Spoth and Redmond 1996*b*; Spoth et al. 1995*c*), a model was

tested in which the PDFY program was expected to directly affect intervention-targeted parenting behaviors and indirectly affect global dimensions of parenting (parent-child affective quality and general child management) through its effect on intervention-targeted behaviors (see figure 4). Operationally defining the global outcome measures was based on a long tradition of literature establishing two basic dimensions of parenting. Multiple self-report and observational indicators were employed to measure these parenting constructs. Three indicators of intervention-targeted parenting behaviors were developed from self-report questionnaire items concerning parents' (1) efforts to involve their child in family activities and decisions (Involve S), (2) communication of substance-related rules and consequences to their child (Rul Con S), and (3) anger management with their child (Ang Mgt S). Five indicators of general child management were identified, three from the self-report and two from the observational portions of the interviews. Parallel self-report and observational indicators assessed standard setting (Std Set S and Std Set O) and consistent discipline (Discip S and Discip O); in addition, there was a self-report child monitoring indicator (Monit S). There were four indicators of parent-child affective quality. These included parallel self-report and observational measures of the noncontingent expression of positive affect (Pos Aff S and Pos Aff O) and negative affect in the parent-child relationship (Neg Aff S and Neg Aff O).

In addition to the hypothesized direct and indirect intervention effects on parenting outcomes at posttest, the model fit to the data included (1) parallel effects among parenting constructs at pretest (except for the direct intervention effect); (2) pretest-to-posttest effects of each parenting construct; (3) correlated residuals of the global parenting constructs within each wave of data, to account for additional correlations between the constructs not accounted for by effects in the model; (4) measurement method effects associated with observational and self-report indicators; (5) correlated pretest-posttest errors for each of the indicator variables (not shown in the figure); and (6) correlated pretest-posttest residuals of the latent method effect constructs (not shown in the figure). Parameter constraints were imposed to ensure that the unstandardized latent construct indicator loadings were equivalent at pretest and posttest for each construct. A likelihood ratio chi-square test of the equality constraints was not significant at the 0.05 level, indicating that the constraints did not substantially impair the fit of the measurement model. Modeling results supported the hypothesized direct and indirect intervention effects. Development of a report on these findings is under way; the primary point of the SEM approach illustrated in this section is to

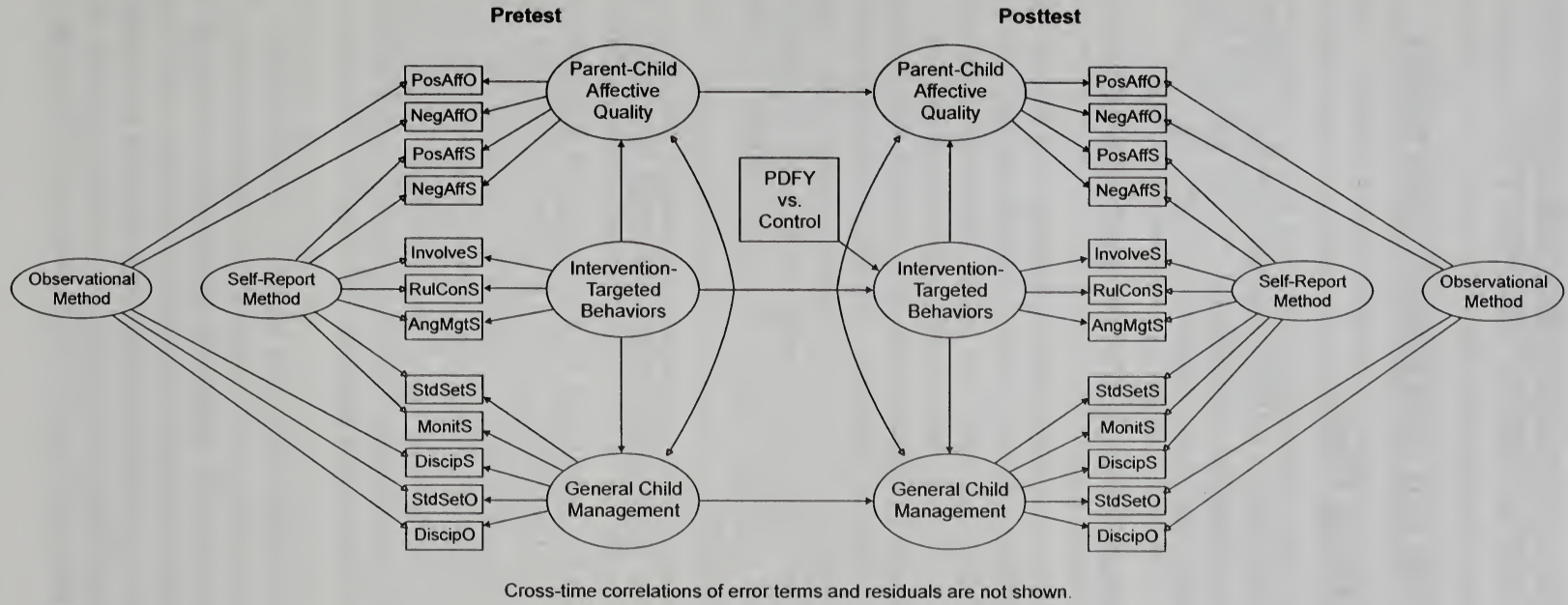

FIGURE 4. *Illustration of the evaluation of multiple direct and indirect intervention outcomes using a latent variable model addressing random measurement error and method biases.*

highlight one solution to several interrelated design sensitivity issues salient in family-focused prevention intervention research.

IMPLEMENTATION AND ENGAGEMENT STRATEGIES

Assessment of Family Needs

The IOM (Institute of Medicine 1994) emphasized that it is important to carefully select the appropriate recipients for an intervention in the intervention research stage of the research cycle (step 3). This effort benefits from a careful review of relevant epidemiological and etiological literature; ideally, it is based on risk and target problem prevalence data from the population into which the intervention will be introduced (or, at least, prevalence data from a very similar population). There is little evidence of the collection of such data prior to the implementation of family-focused prevention interventions, except in the case of a few indicated intervention studies employing screening procedures. In the case of selective interventions, such data can assist in the identification of those individuals or subgroups at the appropriate risk level for the intervention. In the case of an intervention with a universal design that must be offered only to a subgroup of a general population because of a lack of requisite resources, needs assessments can help in identifying that subgroup.

Efforts are currently under way to develop and apply prevention needs assessment technologies on a broad scale. A comprehensive State needs assessment effort is funded through CSAP (Center for Substance Abuse Prevention 1995*a*) and presently involves 18 States. Substance use problems, related risk and protective factor data, sociodemographic data, and resource availability are being variously collected at State, regional, county, and local community levels. Data collected in these States include family-related risk and protective factor data directly relevant to family-focused prevention interventions (Spoth et al. 1995*a*, *b*).

There are several practical advantages of needs assessments in a population targeted for family-focused prevention interventions. First, the types of data collected for a needs assessment can be used to assess prevention intervention outcomes. Such data can also be used to better target interventions, particularly indicated and selective ones, and to better prioritize the allocation of limited intervention resources. In addition, current prevention literature (e.g., Institute of Medicine 1994)

recommends the application of comprehensive, multicomponent interventions, such as a combination of school- and home-based programs (also see Conduct Disorders Prevention Research Group 1992; Pentz et al. 1989). Needs assessments can facilitate decisions about the optimal combination of family and other interventions in a given community. Finally, features of the type of needs assessments promoted by CSAP contribute to collaboration with local stakeholders. That is, needs assessments should involve representatives from multiple sectors of a community, including service providers, and can facilitate collaboration among them. In addition, the process of assessment can stimulate active support and cooperation from community residents.

Intervention Acceptability and Consumer Research Methods

Even if prevention interventions are efficacious, they are of little practical use if they are perceived to be unacceptable to intended consumers. As part of tasks required for intervention efficacy research (step 3), the IOM (Institute of Medicine 1994) refers to the importance of designing an intervention so that it is acceptable and accessible. There has been limited attention directed toward issues of the acceptability and accessibility of family interventions in general and family-focused prevention interventions in particular. The limited literature does, however, suggest that family members' values and preferences concerning formal sources of help for mental health problems can create considerable barriers to service utilization (e.g., Spoth and Redmond 1993*b*; Spoth et al. 1996*e*).

Most of the literature concerning the implications of service-related values and preferences centers around treatment services. Although it is important to be mindful of the variability in service-related values and preferences among families, it is also important to distinguish between acceptability issues concerning prevention interventions vis-a-vis those concerning other mental health services. It seems important to attend to the fact that different types of interventions will vary in acceptability. Although it would be expected that less stigma would be attached to a prevention intervention (e.g., parent education) than to mental health services (e.g., for the treatment of depression), a prevention intervention may more likely be viewed as less acceptable on the grounds that it is less necessary (e.g., as compared with the necessity of treating a suicide threat). Moreover, the time and effort a prevention intervention requires may be perceived as a cost outweighing the benefits of preventing a problem in the future.

A noteworthy gap in the literature on the acceptability of family-focused prevention interventions is the application of consumer research methods to the study of family preferences for the various types of interventions that have been designed, especially those preferences specific to particular segments of the population. Project Family studies have employed a combination of conjoint and cluster analyses to address this knowledge gap (Spoth and Molgaard 1993; Spoth and Redmond 1993*a*; Spoth et al. 1996*a*).

As described in prior reports (e.g., Spoth and Molgaard 1993), conjoint analysis was used to measure the relative value that users place on specific attributes or features of a family prevention intervention program (also see Green and Wind 1975; Johnson 1974; Spoth 1989, 1990, 1991). It has theoretical underpinnings in mathematical psychology and psychometrics (Johnson 1974), has been widely applied in marketing research (Cattin and Wittink 1982), and has been subject to substantial study of reliability and validity (Bateson et al. 1987; Wittink and Walsh 1988). Moreover, conjoint analysis is well suited to assess consumer response to the addition or deletion of specific features of prevention interventions; this type of data can supplement the results of efficacy study in modifications of these interventions (Spoth 1992).

As indicated earlier, conjoint data collection procedures allow an estimation of the relative importance, or utility, that an individual attaches to the attributes of a product or service when these are considered jointly, rather than one at a time (Johnson 1987). Each attribute can be defined by two or more levels (e.g., the attribute program duration could have levels of 1 week, 5 weeks, 10 weeks, and 15 weeks). The goal of conjoint analytic procedures is to assign levels of each attribute a utility, sometimes called a part-worth, reflecting its relative importance to the consumer group of interest. To estimate the utilities in conjoint analysis, participants are presented with a set of possible intervention profiles, with each described as a combination of attribute levels. Perceived preference ratings for these intervention profiles are then obtained. Respondent reaction to only a small fraction of the total number of possible attribute-level combinations is sufficient to estimate their utilities.

In Project Family, a computer-guided telephone interview was used to present participants with sets of attribute combinations to compare. The computer software selected specific attribute level combinations, guiding selection of combinations that would most efficiently estimate attribute

preference values. One of the related rating procedures guided by the computer software is illustrated in figure 5. A key advantage of the collection of such ratings data is that family member preferences for actual interventions representing specific configurations of attributes can be estimated. Furthermore, cluster analyses can be used to assess conjoint analytic data to better understand population segment preferences; this type of market segmentation can guide intervention strategies for promoting interventions (see Spoth et al. 1996*a*).

Developing Effective Research Partnerships

Current prevention intervention research models stress the benefits of researchers' collaboration with "stakeholders," local community members and others who have a stake in the prevention intervention and its outcome (Institute of Medicine 1994). Concurrently, there has been a call for collaborative, ecologically oriented prevention intervention research (Lerner 1994; Small, in press; Yoshikawa 1994). This collaborative approach entails involvement of local stakeholders in each step of the prevention intervention research process. Differences in the objectives, needs, and typical modus operandi of researchers, practitioners, and local stakeholders can create a number of barriers in collaborative prevention intervention research. Differences are often evident in preferred intervention strategies, ranging from those concerning recruitment for the intervention to its implementation and methods of evaluation. For example, Saylor and associates (1990) found that professionals differed considerably from participants in a family intervention when comparisons were made of perceptions of effective techniques for maximizing intervention participation.

The natural tension between local stakeholders and researchers has been frequently discussed by prevention program evaluators over the past two decades (Best et al. 1986; Burke et al. 1987; Gottman and Markman 1978; Green 1977, 1979; Windsor et al. 1984). Ultimately, the goal of the researcher is to disseminate generalizable research findings. Local community practitioners and laypersons differ from the researcher in that their goal is to implement an intervention (and, possibly, an evaluation) so that local needs are met. For researchers, issues of standardization in programming and evaluation, despite differences in population characteristics (e.g., economic base, cultural factors, community resources), are salient and must be addressed before conclusions can be confidently drawn and findings can be generalized. Collaborative research requires a balance between the researchers' needs regarding

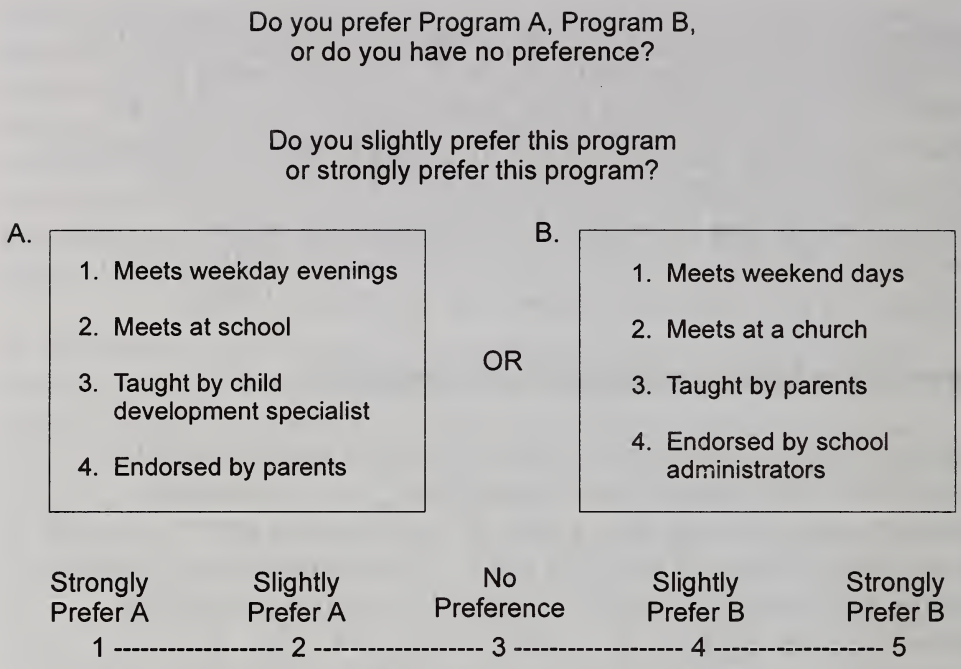

FIGURE 5. *Illustration of question format used in profile preference ratings for conjoint analysis during computer-assisted interviewing.*

standardization and generalization and the practical needs of local stakeholders for local adaptation of intervention and evaluation procedures. Optimally, this type of research results in interventions that are adapted to local needs without compromising the integrity of the intervention.

One model of collaborative research is a large-scale project in Ontario targeting younger children (Peters and Russell 1994). In this project, research advisory groups in each of the intervention communities collaborate with onsite researchers and with a liaison from a core research team at Queen's University. This organizational mechanism has greatly facilitated the reconciliation of researcher and local stakeholder needs, as illustrated in the report by Peters and Russell (1994).

An articulated and promising approach to the prevention of child problem behaviors that encouraged collaboration between researchers and community stakeholders was the functional contextualist framework (Biglan 1995*a*, *b*; Biglan and Hayes 1996). As applied to child problem behaviors, this conceptual framework emphasized community-level

interventions designed to increase the prevalence of successful children in the community (Biglan 1995*a*, submitted for publication, 1996; Biglan et al. 1994). Following the careful selection of proven home-, school-, and media-based interventions, community organizational efforts were undertaken, involving the recruitment of a local agency or coalition to guide implementation, the assessment of all key sectors of the community, and the creation of a social network to support the entire effort. As presented by Biglan and colleagues, the key to success in community interventions was the mobilization of influential people and organizations and the application of consequences that motivated community groups to take actions involving effective interventions. This functional contextualist approach and the collaborative models referenced in the above paragraphs provided family-focused prevention intervention researchers with a range of viable options for forming partnerships with community stakeholders.

Maximizing Recruitment and Retention

The IOM (Institute of Medicine 1994) prevention intervention research model also emphasizes the importance of identifying and securing cooperation from appropriate participants as part of the intervention efficacy study conducted under step 3. This task includes a number of substeps, including the development of effective strategies for recruitment and retention, as well as designing interventions to be sensitive to local culture and customs. There are a number of barriers to effective recruitment and retention of families into family-focused prevention interventions, one of which involves the incongruities between professional and local community approaches to interventions (e.g., Lerner 1994; Small, in press) noted earlier. In general, there is a dearth of guidelines in the literature concerning strategies for securing cooperation among diverse types of populations (e.g., Spoth and Redmond, submitted, 1995*b*), especially important when the interventions are universal.

A wide range of recruitment and retention-related issues and research questions has been examined in Project Family. These have included the aforementioned illustrative applications of consumer research methods to the evaluation of parent preferences concerning family-focused prevention interventions (Spoth and Molgaard 1993; Spoth and Redmond 1993*a*); market segmentation analyses of parents with young adolescents (Spoth et al. 1996*a*); comparative differences in the outcomes of family recruitment strategies (Spoth and Redmond 1994); analysis of

sociodemographic and health belief influences on family participation in these interventions, including the use of path-analytic approaches (Spoth and Conroy 1993; Spoth and Redmond 1995*a*; Spoth et al. 1993, submitted, 1995*d*); the retrospective study of parents' perceived barriers to intervention participation, using mail and telephone survey procedures (Spoth and Redmond 1993*b*; Spoth et al. 1996*e*); and the study of family participation using prospectively collected telephone survey data on theory-based predictors (Spoth et al., submitted, 1997*a*).

An overview of the studies outlined above has been presented elsewhere (Spoth and Redmond 1996*b*), as has been a summary of the lessons drawn from consideration of findings across studies, along with practical experiences in the implementation of family-focused prevention interventions (see Spoth and Redmond, submitted, 1995*b*). Selected findings from these studies will be used to make two points relevant to research issues in this chapter. The first point is that the nature of the barriers operating against family participation in universal or selective interventions warrants substantial levels of resources devoted to recruitment, with the expectation that, even with substantial recruitment resources, there may be lower than optimally desirable recruitment rates. The second point is that family members clearly exert influence on each others' decisions to participate, but patterns of influence are poorly understood. With a better understanding of these social influences, recruitment and retention strategies could be improved.

Despite generally high levels of involvement in parenting enhancement activities by the parents targeted by Project Family (e.g., 81 percent indicate that they read parenting materials—see Spoth and Conroy 1993), there are some major constraints on involving them in family-focused prevention intervention programs. Especially noteworthy are competing time demands or scheduling conflicts. For example, over several studies, competing time demands and scheduling conflicts repeatedly emerged as major barriers to parent participation, largely independent of parents' sociodemographic characteristics (e.g., Spoth and Redmond 1993*a*, 1993*b*, 1994; Spoth et al. 1996*e*). The results from two followup studies on reasons for refusal among nonparticipants are summarized in table 2.

TABLE 2. *Summary of frequency results in studies of reasons for project refusal.*[a]

Pilot Study	
Open-Ended Telephone Inquiry (N = 167)	
Reason for Project Nonparticipation	Number Citing as a Reason (%)
Time and/or scheduling conflicts	86 (51.5)
Not interested	38 (22.8)
Other family member(s) did not want to participate	22 (13.2)
Mail Questionnaire (N = 97[a])	
Reason for Project Nonparticipation	Number Citing as a Reason (%)
Not enough time for parenting skills program	49 (57.6)
Did not want to have family videotaped	49 (57.0)
Inhome interview too long	37 (46.3)
Did not wish to be the subject of research	37 (42.5)
Trial Study	
Telephone Survey Concerning Nonparticipation in the Project Assessment (N = 459[b])	
Reason for Nonparticipation in Project Pretest	Number Citing as an Important Reason (%) / Number Citing as Somewhat of a Reason (%)
Could not find a time to schedule the interview	232 (52.4) / 92 (20.8)
Did not want to be videotaped	180 (41.7) / 95 (22.0)
Other member(s) of the family did not want to participate	99 (22.3) / 92 (20.7)
Inhome interview too long	66 (16.5) / 111 (27.8)
Questions would have been invasion of privacy	72 (16.3) / 139 (31.4)
Telephone Survey Concerning Nonparticipation in the Project Interventions (N = 285[b])	
Reason for Nonparticipation in Project Interventions	Number Citing as an Important Reason (%) / Number Citing as Somewhat of a Reason (%)
Difficulty in attending meetings 5 (or 7) weeks in a row	186 (66.2) / 69 (24.6)
Weeknight programs did not work well for family	169 (60.4) / 57 (20.4)
Program would have taken too much of family's time	99 (35.4) / 82 (29.3)
Already doing fine with parenting	91 (32.6) / 117 (41.9)

[a]Summarizes results from several tables in Spoth and Redmond 1993*b* and Spoth et al. 1996*e*.
[b]The number responding to each item varied.

However, the specific ways in which these time-related barriers are operative in a local community are important to consider.

Intervention recruitment results from two Project Family efficacy studies illustrate a point about the need to understand how time-related barriers operate locally. Based on previously conducted family consumer research, the decision was made to offer an intervention on weekday evenings in both studies. However, an initial Project Family study offered families the option of attending sessions on either one of two weekday evenings. Given the logistical requirements of a subsequent study, an alternative approach was adopted. That is, inquiries were made to determine a single weekday evening that was least heavily scheduled with activities possibly attended by parents in the study; that evening was the only one during which a program was offered. The recruitment rate for the second study was substantially lower (by more than 20 percent); a combination of quantitative and anecdotal evidence indicated that the primary cause was the failure to offer two different evenings as options for attending the intervention in the second study.

The pattern of results in Project Family studies on participation factors suggests that competing time demands and scheduling conflicts may combine with unfavorable attitudes, beliefs, and intentions concerning family interventions, especially among certain segments of the general population, to form a kind of "glass ceiling" on recruitment rates. For example, a cluster analysis of skills training program attribute preferences has indicated that clusters of parents with young adolescents could be distinguished on the basis of parents' preferred commitment of time and effort devoted to participation in program sessions (e.g., preferred number of sessions); a lower level of preferred effort was also associated with a lower level of prior involvement in parent education activities (Spoth et al. 1996*a*). Furthermore, a prospective participation predictor study has shown that a measure of inclination to enroll in parenting programs is associated with level of educational attainment (those with lower levels are more disinclined), as well as with perceived benefits and barriers of such programs (Spoth and Redmond 1995*a*). Notably, this inclination measure is predictive of actual enrollment 10 months following measurement (Spoth et al., submitted, 1995*d*). Lower levels of educational attainment have also been shown to be associated with less favorable attitudes toward family intervention research activities (Spoth et al. 1997*a*).

The findings summarized above suggest that, in at least one segment of the general population, attitudinal factors can combine with time-related concerns to create substantial barriers to recruitment. Moreover, these barriers can be exacerbated when an intervention is part of a research

study. As discussed previously, one of the key implications of this pattern of results is that it is imperative to devote the requisite resources to carefully designed, multicomponent recruitment strategies, in order to maximize schedule flexibility, minimize family time demands, and anticipate and address any concerns family members may have, especially when recruiting general populations. Relevant strategies have been discussed in other reports (Capaldi and Patterson 1987; Spoth et al. 1996*e*). One important facet of such strategies is the consideration of family decisionmaking processes and the reduction of resistance on the part of individual family members. Prior reports have noted that models attempting to explain preventive health behaviors focused on individual decisions or intentions to engage in health-related actions, and not family decisionmaking, such as family decisions about participation in family-focused prevention interventions (Spoth and Redmond 1993*b*). Despite the lack of relevant theoretical work, related empirical research indicates even when one or more family members are inclined to participate, the disinclination of one family member (spouse or child) can result in a refusal decision by the family (e.g., Szapocznik and Kurtines 1989; Szapocznik et al. 1988).

Project Family studies of family decisionmaking factors confirm that fathers are generally less inclined to participate in an intervention than are mothers, consistent with prior research on mothers' and fathers' participation in family interventions (e.g., Klitzner et al. 1990; Lengua et al. 1992). Fortunately, mothers are less likely to report being adversely influenced by their spouses' disinclination to attend than are fathers (Spoth et al. 1996*e*). Nonetheless, much further research is required to clarify the dynamics of family member influences on family recruitment processes and on effective strategies to minimize individual family member resistance to participation in various types of family-focused prevention interventions.

SPECIAL POPULATION STUDY

The premise of the preceding sections is that it is important to assess the acceptability of family-focused prevention interventions, as well as their sensitivity to target population needs and preferences, especially in the case of interventions targeting special populations. Illustrative research with one special population (rural families) was provided. However, there remains a general need for this type of research with other special

populations and a specific need for the development of culturally sensitive interventions with these populations (see Small 1990).

RESEARCH APPLICATIONS THAT PROMOTE FAMILY HEALTH

The fourth step of the prevention intervention research cycle focuses on the generalizability of intervention results and the transportability of an intervention to typical field conditions after being turned over to local administrators. During this fourth step, researchers need to clarify which intervention ingredients are essential and which ones can be adapted to meet local needs. After this work has been completed, it is appropriate for researchers to commence the work of field applications (step 5) and to consider optimal strategies for the dissemination of proven interventions (Rogers 1983).

Research-Based Guidelines for Practitioners

Limited family-focused prevention intervention research has progressed through all of the IOM research phases, raising a key question: What are the optimal research-based guidelines on family-oriented interventions that can be promulgated to practitioners? Work by CSAP (Center for Substance Abuse Prevention 1995*b*) suggests a response to this question in the form of the previously referenced working draft of guidelines on family-centered approaches to prevent alcohol, tobacco, and other drug (ATOD) use among children. The content of this set of guidelines and the process used to develop it highlight (1) how researchers can facilitate dissemination of the state of the art to practitioners and (2) the challenges in doing so when dealing with complex family interventions, few of which have been evaluated through advanced phases of the research cycle. The following section summarizes the process used in the development of the guideline, its utility for practitioners, and the problems yet to be thoroughly addressed in developing such guidelines in the case of family-focused prevention interventions.

The protocol for development of guidelines was established through CSAP's Prevention Enhancement Protocols System (PEPS). PEPS has the objective of compiling, analyzing, and synthesizing existing knowledge on specific topics in the prevention of ATOD use, addressing the topic of family-centered approaches (Center for Substance Abuse Prevention 1995*b*). The purpose of this effort was quintessentially

pragmatic, that is, to assist practitioners in States and communities in prevention program planning, resource allocation, and the matching of programming to the needs of various local populations. The development of individual guidelines began with a planning group of recognized experts who reviewed approaches to guideline development and formulated questions for specific guideline topics. A Federal resource panel for each guideline topic provided further policy-relevant and other information for guideline development. The Federal resource panel also recommends candidates for an expert panel having the function of developing the guideline and planning for guideline distribution.

As suggested earlier, guideline development focuses on the careful evaluation of research evidence and prevention program documents concerning specific interventions or interrelated types of interventions. This evaluation follows a methodology that includes a protocol for the selection of published and unpublished intervention documentation and for the assessment of the validity of that documentation. The accumulated document-based evidence is synthesized, and its strength is assessed according to a set of rules of evidence. Rules of evidence criteria for the family-oriented intervention guideline evolved from an original set developed by medical clinicians, as illustrated in a medical practice guideline produced by the Federal Commission on Chronic Illness (1957). The purpose of these original rules of evidence was to provide guidelines to physicians on the most effective preventive care practices. An update on these guidelines was provided by the Agency for Health Care Policy and Research (AHCPR), as illustrated in its 1993 report (Agency for Health Care Policy and Research Depression Guideline Panel 1993), and served as a model for the CSAP guideline on family-oriented interventions.

The author's experience on the CSAP panel that is currently developing guidelines for family-oriented ATOD use prevention interventions suggests that the CSAP panel guidelines are potentially quite useful in the dissemination of research findings. In addition to a summary of the strength of evidence on specific prevention approaches, the family-oriented guideline will provide practitioners with (1) a summary of the current status of U.S. families, focusing on substance-related problems and risk factors, (2) theoretical models guiding interventions, (3) guidelines for developing and implementing programs, and (4) program resource information. However, several challenges encountered in the development of this guideline highlight the potential

problems family prevention intervention researchers can face when developing and disseminating such guidelines.

There are several challenges associated with the fact that the strength of evidence guidelines for practitioners were originally designed to evaluate evidence for specific, relatively less complex medical intervention protocols. First, family interventions target multiple individuals interacting in family systems, not the single individual typically targeted in the case of medical practice. Thus, these family interventions are often complex and multicomponent when compared with the medical practice case, and the content of a specific intervention can evolve in a fairly dynamic way, with frequent changes in the actual intervention delivered across time and situation (e.g., the same intervention title may reflect different interventions). Because of this, these interventions are more likely to deviate from written intervention standards, and different studies may yield results on superficially similar interventions that vary in important ways. Moreover, there is often a wide range of objectives targeted by family interventions, with likely variability in level of success across outcomes (i.e., a given intervention could be judged as effective for one outcome, but not for another). In the study of family interventions there is also variability in the measurement of identically or similarly labeled outcomes within and across intervention programs and across time; this challenges precise comparisons of observed outcomes across studies. Variability in sample composition, sampling procedures, and other methods exacerbates this problem.

Despite the formidable problems in apprising practitioners about the evidence concerning family-focused prevention interventions, a failure to synthesize research findings for practitioners willing to appropriately consider them in their practice seems even more problematic. Fortunately, several family-focused prevention researchers are currently engaged in the task of defining optimal methods of dissemination of research findings despite the aforementioned challenges (e.g., Center for Substance Abuse Prevention 1995*b*) and have made considerable progress.

Facilitating Policymaking

Lerner (1994) noted that there is a dire need for a national policy on the development of healthy youth. He describes various sociodemographic trends over the last three decades that have jeopardized healthy child development. These trends have not been accompanied by adequate

attention to their relevance for public policy. Family-focused prevention intervention researchers can play an important role in related policymaking, focusing on both youth development and family functioning.

Optimally, policymaking at the Federal level, as well as that at the local and State levels, should be informed by current research findings on family processes and family interventions. A discussion of the intricacies of the complex relationship between family-related research and various types of public policymaking lies well beyond the scope of this chapter. However, there are some important policy-related issues for family-focused prevention intervention researchers to consider, and it is appropriate to make some general points in this connection.

If it can be argued that there is an obligation on the part of the community of family-focused intervention researchers to facilitate the application of their work to meet the needs of families at risk, they must seriously consider ways in which this research can inform relevant public policy. In so doing, challenges to the community of researchers are evident. As noted by Bronfenbrenner (1979) almost two decades ago, science needs public policy more than public policy needs science. Nonetheless, there is some evidence in the past two decades of success in the abilities of social science professionals to influence public policy.

The literature on psychologists' efforts to influence public policy, particularly health policy, suggests some useful points to consider in evaluating the optimal relationship between family-focused prevention research and public policy. One point noted in this literature is that researchers and other professionals need to better understand the personal nature of public policy and the political process (DeLeon et al. 1995; Vincent 1990). Optimal means of identifying recipients of appropriately communicated prevention intervention research findings need to be considered from this perspective. In assessing research priorities, the type of intervention-related research that is most useful to policymakers should be evaluated, including cost-effectiveness and cost-benefit studies (see Chatterji et al., this volume). In this vein, the benefit of facilitating field implementation and evaluation of well-designed and efficacious interventions should be considered (see Altman 1995). Also, studies designed to test the results of Federal and State policies should be promoted (Pierce and Gilpin 1995). However, in all matters concerning the application of research to policymaking, it is important that an empirical orientation remain at the forefront (Kaplan 1995).

STRENGTHENING THE FOUNDATION

Ethics and Research Priorities

IOM (Institute of Medicine 1994) noted several factors in research on the prevention of mental disorders that can complicate the already complex issues that generally apply to research involving human subjects. For further information on a wide range of basic ethical issues and complicating factors in prevention research, the reader is referred to the IOM report (Institute of Medicine 1994, pp. 397-405). Research on prevention interventions with high-risk young adolescents has raised additional issues concerning iatrogenic effects associated with aggregation of such high-risk youth in intervention groups (Dishion and Andrews 1995). The present discussion, however, focuses on one of the recommendations made in the IOM report, suggesting a type of moral imperative for family-focused prevention intervention researchers.

At several points in the IOM report, the argument is made that researchers need to be responsive to the needs of research participants. Partnerships with members of the communities involved in the research are recommended. IOM cites an article by Trickett and Levin (1990) discussing how research partnerships can help in the identification and resolution of ethical issues. A related point is that families' needs should be carefully considered when deciding priorities for the allocation of limited research resources, at both the local and national levels.

Several elements should be balanced in the determination of research priorities; some potentially difficult analyses of tradeoffs may be required. For example, such analyses could involve a determination of how much of the limited research funding should be directed toward programs for families with children whose basic needs are threatened (see Carnegie Council on Adolescent Development 1995) versus families where although the child's basic needs are being met, there is likely to be a lack of appropriate nurturance and guidance (see Small 1990). Such analyses could also address the balance between the need for funding intervention efficacy research and the need for research focusing more directly on policymaking concerning policies that have large, direct, and immediate impact on one or more types of family needs.

Development of Research Infrastructure

One of the most important issues in addressing priorities for future research in family-focused prevention interventions concerns the development of the infrastructure to support this research. Federally funded efforts directed toward setting the agenda for prevention research offer models to consider in addressing research infrastructure for the area of family-focused prevention intervention research.

The National Institute of Mental Health (NIMH) produced a report on a national research agenda for the prevention of mental disorders (National Institute of Mental Health 1993; also see Coie et al. 1993). In this report, various recommendations for the improved organization of the scientific effort were presented that were directly relevant to family-focused prevention intervention research. Similar to the purpose of the organizational recommendations made in the NIMH report, the appropriate organization and monitoring of scientific work are required to meet the needs of the growing field of family-focused prevention intervention research. This could include consideration of the organization of an advisory committee to address a variety of issues such as research priorities, collaboration among all agencies funding relevant research, collaboration and coordination among researchers focusing on this area of research, and technical assistance to researchers. Efforts to build the research infrastructure should also include consideration of the further development of specific and effective mechanisms for (1) training investigators in family-focused intervention research, (2) updating relevant grant review processes, (3) facilitating exchanges among researchers in this area, (4) facilitating multisite research programs, (5) facilitating dissemination of findings to practitioners and policymakers, and (6) linking with units in NIDA that can facilitate the development of the above mechanisms.

CONCLUDING COMMENT

The literature suggests that the field of prevention science has matured (Coie et al. 1993; Institute of Medicine 1994; National Institute of Mental Health 1993). As indicated by Catalano and colleagues (this volume), a new paradigm of empirically based risk- and protective-focused prevention has emerged, and the practicality of this paradigm is indicated by the success of risk- and protective-focused interventions. In the author's view, the maturation of prevention science is most clearly

revealed through a range of strategies that reflect attempts to better orient research toward practice. This chapter provides a number of illustrations of a stronger orientation toward practice. Some of the strategies illustrated entail benefits for practice that are relatively more subtle and indirect, such as the benefits of more definitive findings on the efficacy of family-focused interventions obtained through improvements in the sensitivity of evaluation designs. Yet other strategies have obvious and direct benefits to practice, such as (1) the utility of improved methods for programmatically synthesizing etiological and other relevant research to guide optimal intervention design, (2) the application of consumer research methods to improve recruitment and retention, (3) the use of ecological and contextual approaches to research partnerships in communities, (4) the dissemination of the state-of-the-art research findings to practitioners, and (5) the appropriate application of research findings to policymaking. Although the sheer number and the complexity of the issues confronting family-focused prevention intervention research are daunting, the promising strategies for addressing these issues in a pragmatic manner underscore the potential for achieving the ultimate goal of intervention research—strengthening families.

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ACKNOWLEDGMENTS

Work on this chapter was supported by National Institute on Drug Abuse research grant no. DA 070 29-01A1, by National Institute of Mental Health grant no. MH 49217-01A1, and by Center for Substance Abuse Prevention contract no. 277-95-1038. The author gratefully acknowledges the valuable comments on an earlier draft of this article from Elizabeth Robertson and from Project Family colleagues Rick Kosterman, Cleve Redmond, and Daniel Russell.

AUTHOR

Richard L. Spoth, Ph.D.
Project Director for Prevention Programming and Research
Center for Family Research in Rural Mental Health
Social and Behavioral Research Center for Rural Health
Iowa State University Research Park
Suite 500
Building 2
2625 North Loop Drive
Ames, IA 50010

APPENDIX—KEY CONCEPTS AND ASSOCIATED DEFINITIONAL ISSUES

Definition of the Family

A review of the literature reveals varying implicit and explicit definitions of the family, reflecting considerable differences in concept inclusion-exclusion criteria. Definitions range from those with relatively narrow inclusion criteria to those substantially broadening the definition to include a wide variety of family structures or groups of continually interacting individuals (Center for Substance Abuse Prevention 1995*b*). Even among researchers defining the family in broad terms, the breadth of inclusion criteria differs. For example, Small (1990) proposes a broad definition and refers to ". . . a large variety of family structures (e.g., single parent, step or blended, adoptive, foster, two-parent)" (p. 29). However, in its working draft of guidelines for family-centered approaches to the prevention of substance abuse, CSAP defines the family even more broadly, ". . . as a group of interacting individuals who are related interpersonally over a continuous period of time and who share a social network as well as material and social sources of support" (p. xiii). Thus, the CSAP definition is broader because it does not rely on legal or blood ties.

As suggested in the introductory paragraph, the definition of the family determines the scope of the work to be considered within the confines of the prevention intervention research enterprise. It is reasonable to assume that the broader the definition of the family and the more varied the types of families considered, the larger the task of designing, implementing, and evaluating interventions becomes. If limited resources are available for family intervention research and the definition of the family drives the allocation of research resources, optimal priority setting is paramount, especially considering the critical role that intervention research can play in addressing the needs of families (Center for Substance Abuse Prevention 1995*b*). However broadly defined, it seems helpful to define the family as precisely as possible. Imprecision in the term "family" increases potential for inconsistent use of the term; inconsistencies among researchers in the definition of family can become an issue in generalizing research findings and in practical research applications, including the development of coherent Federal policies concerning the family.

Definition of Prevention Research and Prevention Interventions

IOM (Institute of Medicine 1994) is careful to point out that only the steps involved in the investigation of prevention intervention processes and outcomes (steps 3 and 4 of the Preventive Intervention Research Cycle) constitute prevention intervention research per se. Although this research requires the review of findings from epidemiological and etiological research (steps 1 and 2), original studies in these areas are not considered prevention research, nor is facilitation of large-scale field implementation and intervention evaluation by researchers (step 5). Moreover, to be classified as prevention intervention research, a "rigorously designed" pilot study is required, at a minimum (Institute of Medicine 1994, p. 365).

When applied to family-focused prevention intervention research, the IOM definition obviously excludes basic research studies of family-related risk and protective mechanisms. It also excludes what some may consider a study, such as the collection of participant satisfaction data at the conclusion of a prevention program, at least if it is not part of well-designed programmatic research. Addressing the advantages and disadvantages of narrow versus broad definitions of prevention research extends beyond the confines of the current discussion. The primary point is that the definition of family-focused prevention intervention research can have important implications, not the least of which is delineating what is considered appropriate to fund with limited research resources. Therefore, it seems helpful to address this definition in the context of future research directions.

A related issue concerns the definition of prevention intervention. IOM (Institute of Medicine 1994) proposes a very specific definition of prevention intervention in the context of its report on the reduction of risk for mental disorders. That is, ". . . the term prevention is reserved for only those interventions that occur before the onset of a disorder" (p. 23). Applying this definition to the case of family interventions targeting substance-related problems raises some important issues. For example, the working draft of CSAP's (Center for Substance Abuse Prevention 1995*b*) report on family-centered approaches to the prevention of ATOD use considered family therapy as an "indicated" prevention measure. The reasoning was that such therapy can help family members develop improved interpersonal skills as well as enhance parenting skills in a manner that improves family functioning (Center for Substance Abuse

Prevention 1995*b*). In other words, family therapy can serve the purpose of family-related risk reduction for children who are at risk for substance abuse. However, researchers addressing prevention-related definitional issues (e.g., Gordon 1983) have noted the importance of distinguishing between indicated prevention and treatment (see discussion in the next section). In addition, the implications of this broadened definition need to be considered in light of the requisite procedures for evaluating the efficacy and cost-effectiveness of family therapy as a prevention strategy vis-a-vis other family-risk reduction interventions that target skills-building to reduce problem behaviors among children (e.g., conduct-disordered boys).

Universal, Selective, and Indicated Interventions

A number of typologies of prevention programs have been proposed over the past 40 years (Auerbach 1987; Federal Commission on Chronic Illness 1957; Gordon 1983, 1987; Institute of Medicine 1994). Gordon's (1983, 1987) typology of universal, selective, and indicated interventions has received considerable attention since it was proposed; it was adopted by IOM (Institute of Medicine 1994) in its report on the prevention of mental disorders.

Universal interventions are those that target the general public or a subcategory of the general public who show no signs of experiencing a condition or disease and are not at known risk for experiencing the condition or disease; the benefits clearly outweigh the costs for everyone. Selective interventions are those directed toward individuals who are members of a subgroup of the population whose risk of having a condition or disease is above average. Indicated interventions are those applying to persons identified individually as having a characteristic (e.g., risk factor) or abnormality that places them at high risk for a condition or disease. In this latter case, cost-benefit tradeoffs need to be closely examined (Gordon 1983). The inclusion and exclusion criteria in this typology of universal, selective, and indicated interventions (particularly those distinguishing universal and selective interventions) can be confusing and difficult to ascertain before the implementation of an intervention.

Gordon's (1983) intention in creating his classification scheme was to acknowledge that the etiology of mental disorders was sufficiently poorly understood and that the classification of primary, secondary, and tertiary prevention (implying an understanding of cause-effect or risk-disease

relationships) was inappropriate. He thus proposed that prevention interventions be classified in a manner ". . . more closely linked to the *practical* (author's emphasis) considerations that govern proper application of preventive interventions" (Gordon 1983, p. 101). This alternative classification combines consideration of the targeted population group and the intervention's balance of benefits against risks and costs. However, a number of issues come to the fore in an application of this classification scheme to family-focused prevention interventions in part because (1) the scheme was originally intended to be applied to medical disorders and not to mental disorders, with a primary focus on individuals rather than families, and (2) there is a lack of empirical work related to intervention costs and benefits in most areas of family-focused prevention intervention research.

Incorporating consideration of risk or cost and benefit criteria for classification purposes can be problematic. Because family interventions involve multiple individuals, and because there has been little empirical work on the costs and benefits (e.g., expected effect sizes) of family-focused interventions, it may not be safe to assume that interventions that target the general public (universal) or individuals in subgroups whose risk is higher than average (selective) will be cost beneficial. In addition, the distinguishing characteristics (e.g., level of risk of the population to which the intervention is applied) for the three types of interventions form continua, and it is not always clear at what points on these continua an intervention should be categorized one way or another (at least in the case of the universal or selective interventions). For example, the author's research focuses on interventions targeting families with students attending schools in districts with higher than average proportions of lower income families. Should this be considered a universal or a selective intervention? Researchers to whom this question has been posed have provided differing opinions. Related to this point, universal and selective interventions are not inherently of one type or another, because a given intervention can be applied to a universal (general) population at one time and to a selective population at another time. The ambiguities in definitional criteria have created difficulties in analyses and reporting of findings specific to each of the intervention categories (e.g., Center for Substance Abuse Prevention 1995*b*).

Appendix: Participant List

The participants of the technical review are listed below.

James F. Alexander, Ph.D.
Rebecca S. Ashery, D.S.W.
Karl E. Bauman, Ph.D.
Anthony Biglan, Ph.D.
Nancy Boyd-Franklin, Ph.D.
Brenna H. Bry, Ph.D.
William J. Bukoski, Ph.D.
Felipe G. Castro, M.S.W., Ph.D.
Richard F. Catalano, Ph.D.
Linda M. Collins, Ph.D.
Thomas J. Dishion, Ph.D.
Lawrence E. Gary, Ph.D.
Bernard Guerney, Jr., Ph.D.
Hyman Hops, Ph.D.
Karol L. Kumpfer, Ph.D.
John E. Lochman, Ph.D.
Lynn McDonald, A.C.S.W., Ph.D.
Robert J. McMahon, Ph.D.
Kathleen R. Merikangas, Ph.D.
D. Paul Moberg, Ph.D.
David L. Olds, Ph.D.
Zili Sloboda, Sc.D.
Richard L. Spoth, Ph.D.
José Szapocznik, Ph.D.
William L. Turner, Ph.D.
Carolyn Webster-Stratton, Ph.D.
Lisa Werthamer-Larsson, Sc.D.
Robert A. Zucker, Ph.D.

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NIH Publication No. 99-4135
Printed December 1998